

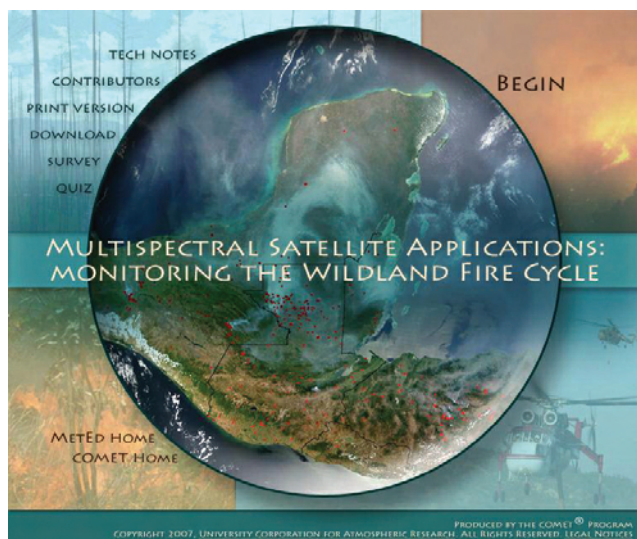


NEWSLETTER

**National Weather
Association**

NO. 08 – 6 JUNE 2008

REMOTE SENSING AND FIRE WEATHER



The remote sensing committee strongly recommends that NWA members enhance their knowledge for the fire weather season by reviewing the online training module hosted at the COMET MetEd Web site. The training module is titled “Multispectral Satellite Applications: Monitoring the Wildland Fire Cycle”.

The module describes current and future satellite instruments and products used for monitoring the fire cycle, with an emphasis on polar-

orbiting satellites. Product information is presented in the context of the fire cycle: from assessing the pre- and post-fire environment to detecting and monitoring active fires, smoke and aerosols. The module is intended for a wide range of users involved

Continued page 7

President's Message: Be Storm Wary, Storm Ready

A half-mile wide tornado approached the western edge of the town of Parkersburg, Iowa, shortly before 5 p.m. CDT on Sunday, May 26, 2008. The tornado increased in size and intensity reaching EF5 status as it crossed the southern half of the town. The three-quarter mile wide vortex destroyed between 100 and 200 homes including several well-built structures that were removed completely from their attending foundations. I refer you to the Des Moines National Weather Service Forecast Office for a review of this devastating event including a summary of the damage, images of the destruction, and radar reflectivity and velocity plots (www.crh.noaa.gov/images/dmx/parkersburg/Parkersburg-Storm-Damage-Survey.pdf). The NWA can be very proud of its NWS and broadcast members who worked tirelessly to provide advanced warning (37 minutes) of this devastating tornado.

As of this writing, the loss of life attributable to tornadoes in 2008 is 118, the second largest total since the completion of the Doppler radar network in the early 1990s. We can debate the causes for the unusually high number of deadly tornadoes; however, the death toll remains a cold, hard statistic. Severe storms — particularly tornadoes — corner the market when it comes to capturing our fascination with weather. Their inherent danger is recognized and in most cases given the appropriate regard. Yet, non-severe thunderstorms are seldom accorded a similar degree of respect. There is a public perception that only severe thunderstorms are capable of inflicting damage and loss of life. Just spend a summer afternoon at an outdoor sporting event where air mass thunderstorms tend to be a common, uninvited attendee and I guarantee you will witness frequent, even

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**YOUR PRESIDENT'S MESSAGE:
GIVING STORMS DUE RESPECT**

TAF Format Change Effective November 2008

TAFs (Terminal Aerodrome Forecasts) for 32 large airports will become valid for 30 hours starting on Nov. 5. All TAFs will incorporate a new date and time format.

Operational impact is minimal for those using raw TAF data; however, anyone providing a "TAF Decoder" will have to update their system to accommodate the date and time change.

Links to information on this change can be found on the Aviation Weather Center's home page, www.aviationweather.gov, including details on test TAFs that will be issued so that customers can evaluate their decoders.

Aviation Meteorology Committee

President's Message continued from front

widespread examples of poor weather judgment. I am convinced the root of this negligence is not arrogance but a lack of lightning education.

I coached a travel soccer team a number of years ago when I lived in Georgia. We were participating in a large weekend tournament attended by teams from all over the state. Abundant low-level moisture and ample heating were present, suitable for widespread disorganized convection. I was concerned about the threat of lightning given these conditions and the large number of people occupying an open area without shelter. I queried the organizers for their plan should storms develop. The response was "we play unless we see lightning." More recently, an adult member of my extended family asked me if thunder can exist without the existence of lightning.

These examples serve as a reminder that the opportunity to save lives through lightning education has never been greater. For example, huge crowds attending outdoor events (e.g., motor racing can attract crowds of 150,000) are commonplace worldwide. Yet, plans for adequate evacuation in the presence of threatening weather are questionable, if available at all. The potential for multiple fatalities from a single lightning strike remains a great concern at golf courses, pools, concerts, any outdoor location where a large congregation is present. On August 27, 2000, a strong thunderstorm moved across the Virginia Tech campus minutes before the scheduled start of a televised football game between the Hokies and Georgia Tech. Lightning struck a nearby parking lot prompting a postponement of the game. The strike was caught on camera. The players and coaches were safely inside, but the tens of thousands outside remained at considerable risk.

You may be surprised to learn that the 30-year average annual loss of life attributable to lightning is 62, a figure identical to the current three-year average number of tornado fatalities. This is a shocking statistic! The NOAA Web site on lightning safety (www.lightningsafety.noaa.gov), states most of the lightning deaths are males engaged in an outdoor activity. Six lightning deaths have been reported so far in 2008, five were males who were outside — two seeking shelter beneath trees. I chose to comment on lightning in this month's President's Message to coincide with lightning awareness week which is June 22-28. We must work tirelessly as an organization to educate all we come into contact with that **every thunderstorm is a potential killer**. Your National Weather Association maintains a link to several lightning safety tips (www.nwas.org/links/lightning.php). Please visit it and direct your family, your friends and your colleagues to do so as well.

Enjoy these warm months, but place safety above all else. I am just a click away at President@nwas.org. I look forward to hearing from you!

John Scala
President



NWA INCOME AND EXPENSES FOR 2007

Income for 2007

Membership Dues.....	\$114,749.50
Donations:	
Sol Hirsch NWA Education Fund	3,765.50
General Fund Donations	8,599.00
Subscriptions.....	4,529.00
Publication Page Fees.....	14,200.00
Reprints	0.00
Radio-TV Seal Program	14,828.00
Publication Sales.....	41.25
Advertising Sales.....	240.00
Annual Meeting.....	89,065.85
Postage Reimbursement	270.00
Interest	7,026.26
Dividends.....	6,517.64
NWA logo items and misc.....	1,439.56
Total Income	\$265,271.56

Expenses for 2007

Digest Printing	\$ 17,422.32
Newsletter Printing.....	9,681.03
Reprints	225.00
NWA Seal of Approval certificates	234.00
Other Printing.....	3,209.63
Personnel Salaries.....	82,250.00
Temporary Help Fees.....	13,664.50
Taxes and Soc. Sec./Medicare.....	8,421.78
Payroll Management Fees	836.71
Accounting fees.....	3,500.00
Postage and Shipping.....	27,887.72
Annual Meeting.....	40,950.67
Communications.....	4,956.63
Equipment and Maintenance	2,642.28
Office Supplies.....	4,980.43
Awards	1,330.00
Scholarships & Grants	4,500.00
Education Fund Grants	5,000.00
Travel	8,556.47
Bank and Credit Card Service Charges..	3,284.38
Refunds	776.50
Insurance	2,440.06
Office expenses	11,912.86
NWA logo items	1,901.93
Miscellaneous	707.77
Total Expenses	\$261,272.67

INCOME over EXPENSES + **\$3,998.89**

This is a summary of the NWA's IRS Form 990 submitted in May for nonprofit organizations exempt from federal income tax.

Net fund balances at the end of 2007 were \$308,414.56. THANKS to the many volunteers and contributors who helped make that happen.

33rd NWA Annual Meeting: Preregistering Now!

The National Weather Association's 33rd Annual Meeting will be held at the
Galt House Hotel & Suites, on the waterfront in downtown Louisville, Ky.

October 11-16, 2008

Utilizing Our Past
to Improve Our Future

Why Preregister?

The NWA Annual Meeting preregistration fee includes a preprint volume with program and abstracts. For the period of days registered for, it also includes admission to all presentation, workshop and exhibit sessions and coffee/refreshment breaks.

Fees - Preregistering Available until Oct. 3

Oct. 12, Broadcast Meteorology Workshop & Student

Sunday Session: \$80 for NWA members and presenters (student and retired members \$50); \$110 for non-members (student and retired non-members \$75). This includes exhibits & Tape Swap.

Oct. 13-16, Annual Meeting sessions/activities and

Wednesday Awards Luncheon: \$190 for NWA members and presenters (student and retired members \$110); \$225 for non-members (student and retired non-members \$140).

Special one-day rates for Oct. 13-16

\$75 for NWA members and presenters (student and retired members \$50); \$95 for non-members (student and retired non-members \$70)

Day rates do not include the Awards Luncheon; luncheon tickets are \$30 each.

Please monitor our Web site, www.nwas.org, for information on exhibits, special accommodations, registration and the overall meeting program. A preliminary agenda is expected to be online in August as well as published in the Newsletter.

Hotel

The Galt House is a full-service hotel and convention center in the heart of a revitalized downtown Louisville.

The hotel offers two room options: "Deluxe Rooms" in the West Tower (\$97 per night*) and "Suites" in the East Tower (\$130 per night*). Up to four people may be accommodated in a room for an additional \$10 per night per person.

For phone reservations, call **(800) 843-4258** and request the National Weather Association 2008 group rate. A credit card number will be requested but no charges will be made at the time of the reservation.

For online reservations, visit www.galthouse.com, go to "Reservations" and follow the directions for making group reservations. The ID Number to use for this meeting is **829545**.

*** To obtain the NWA discount rate, reserve your hotel room NO LATER THAN Sept. 10, 2008.**

Contacts for suggestions & to volunteer

Annual Meeting Program Committee Chair John Gordon - annualmeeting@nwas.org

Broadcaster Workshop Program Chair Bryan Karrick - bkarrick@hearst.com

33rd Annual NWA Meeting: Preregistration Form

Mail this form with all fees by Oct. 3, 2008 to: NWA Meeting, 228 West Millbrook Road, Raleigh, NC 27609-4304 USA. Make payment to "NWA" in U.S. funds by a U.S. bank check, money order or government/institution purchase order. Preregistration by credit card is available on the NWA Web site at www.nwas.org/meetings/nwa08mtg.html

Name (for name tag): _____

Employer, School or other Affiliation (for name tag): _____

City/State (for name tag): _____

Telephone number and e-mail address: _____

Arrival Date at meeting: _____ Departure Date from meeting: _____

Preregistration fees: \$ _____

Number of extra Awards Luncheon tickets (\$30 each): _____

Total Funds enclosed: \$ _____

Please Circle all applicable phrases listed here:

NWA member

NWA local chapter member

Non-member

Student

Retired

Session Chair

Presenter

Program committee member

Local Arrangements committee member

I'm interested in the 6th Annual Golf Outing

I will bring a tape to the Tape Swap

I'll attend the Tape Swap but not bring a tape

Tony Lupo Awarded 2008 Kemper Fellowship for Teaching Excellence by Mizzou

University of Missouri Chancellor Brady Deaton and Chairman Jim Schatz of Commerce Bank awarded one of the 2008 William T. Kemper Fellowships for Teaching Excellence to Tony Lupo, associate professor of Soil, Environmental and Atmospheric Sciences in the College of Agriculture, Food and Natural Resources.

Deaton, Schatz and a group of professors, administrators and staff paid a surprise visit to Lupo's classroom to honor him with the Fellowship, which includes a \$10,000 award. Fellowships are awarded to five outstanding teachers at the University of Missouri each year.

The William T. Kemper Fellowships for Teaching Excellence were established in 1991 with a \$500,000 gift. Kemper, a 1926 MU graduate, was a well-known civic leader in Kansas City until his death in 1989. His 52-year career in banking included top positions at banks in Missouri, Kansas and Oklahoma. Commerce Bank manages the trust fund.

NWA Member and Fellowship Recipient Tony Lupo

In the ten years that Tony Lupo has worked at the University of Missouri, he has maintained an impressive level of involvement. Lupo has directed 32 undergraduate research projects, created the Storm Chase Club and developed three new courses. He also continues to teach an average of four to six courses each year.

Lupo's work has gained recognition far beyond MU. In 2007, he contributed work to the Intergovernmental Panel on Climate Change that received the 2007 Nobel Peace Prize along with former Vice President Al Gore.

"Dr. Lupo is an exceptional teacher who is known both for his enthusiasm and his ability to teach complex principles in an understandable manner," said Paul Vaughn, associate dean and director of the College of Agriculture, Food and Natural Resources. "Dr. Lupo has been described as a tireless teacher, an individual whose passion for the science of meteorology is such that his students simply cannot keep from sharing his enthusiasm."

A Cruel Double Whammy and Other Interesting Events

On May 25, 2008, the first tornado rated as an EF5 in Iowa since the F5 in Jordan on June 13, 1976, carved a 43 mile path of destruction from Parkersburg to New Hartford to northeast of Waterloo leaving seven people dead. (See Figure 1 and the President's Message for more information.) Unfortunately residents of these towns and the surrounding area were dealing with another weather disaster in early June.

Days of repeat storms during the first eight days of June caused flooding in Parkersburg, New Hartford and surrounding areas resulting in new record stages, sometimes exceeding the floods of 1993. Beaver Creek at New Hartford reached a new historical crest of 15.43 feet on Sunday evening, June 9 (Figure 2.). Newspaper images from New Hartford showed homes inundated by several feet of water. NOAA/NWS data states that at a stage of 14 feet, the entire town of New Hartford is flooded except for some northern and the near western sections.

The previous high historical crest at New Hartford was 13.50 feet on June 13, 1947. In 1993 the river reached 13.45 feet. At the time this article was written, more thunderstorms were rolling across Iowa and precipitation chances were in the forecast through the remainder of the week.

In early June, major flooding was seriously impacting communities from Iowa through Wisconsin to Illinois and Indiana. The NOAA/NWS reported up to 11 inches of rain fell over portions of southern and central Indiana from June 6-7. The hospital in Columbus, Ind., had to be evacuated due to flooding and a bridge on Interstate 70 in western Indiana was closed due to damage. Other bridges in the southern part of the state collapsed. Major to record flooding occurred on the White River from Newberry to Edwardsport late in that



Figure 1

weekend. See Figure 3 for the 30-day observed rainfall across portions of the Midwest ending on June 16.

While the Midwest dealt with excessive rainfall, the East Coast was dealing with excessive heat from southern New England to North Carolina. In Raleigh, N.C., preliminary data from the NOAA/NWS showed that during the first ten days of June, the high temperature exceeded 90 degrees on eight days — well above the normal high temperature of 84 degrees for this time period. The high rose to 100 on June 7 and 9; and 101 on June 8 and 10. Record high temperatures were broken on the four days between June 6 and 10.

Shreveport, La., broke numerous rainfall records on May 13, 2008. Data from the NOAA/NWS showed that 4.65 inches fell within an hour breaking the old one-hour record for the site

“A tireless teacher ... students simply cannot keep from sharing his enthusiasm.”

In 2006, Lupo was honored with the CAFNR Senior Level Teaching Award and, in 2005, he won the Teaching Award of Merit from the MU Chapter of Gamma Sigma Delta.

Lupo is enthusiastic and passionate about what he teaches and is highly praised by his students for being helpful and personable.

“In many respects, Dr. Lupo is like a member of my family,” said Justin Glisan, a graduate student who had Lupo as an advisor for the past six years. “This type of relationship augmented my academic career and helped make me the person I am today.”

Lupo received his associate's degree at Cayuga County Community College, his bachelor's degree at State University of New York and his master's and doctorate at Purdue University.



Editor's Note: Since this award was announced in the spring, Tony Lupo (pictured) was named to be the Department Chair for the Department of Soil, Environmental and Atmospheric Sciences in the College of Agriculture, Food and Natural Resources at the University of Missouri.

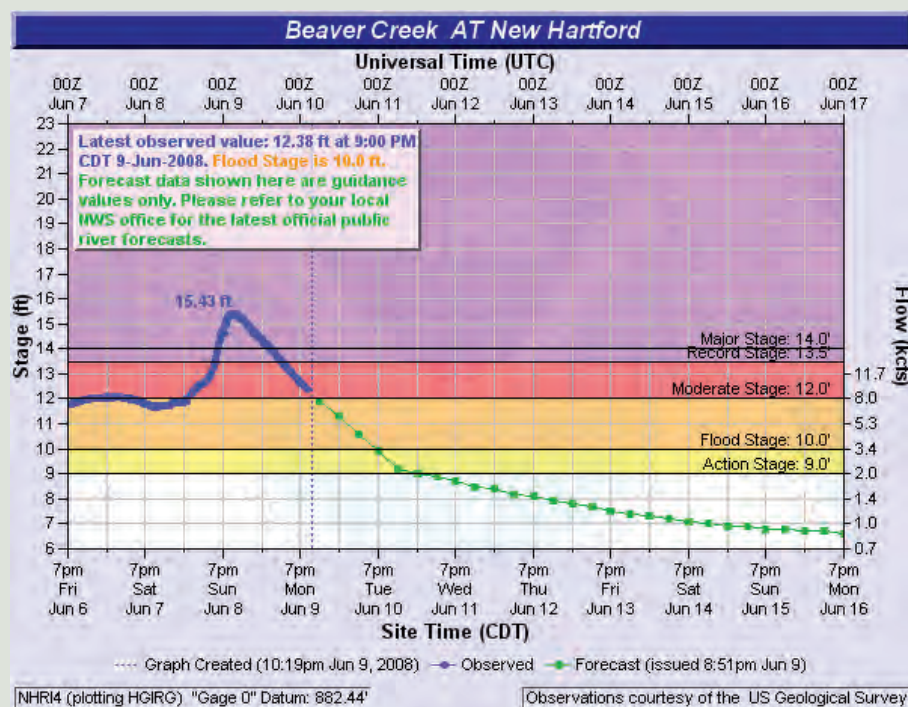


Figure 2

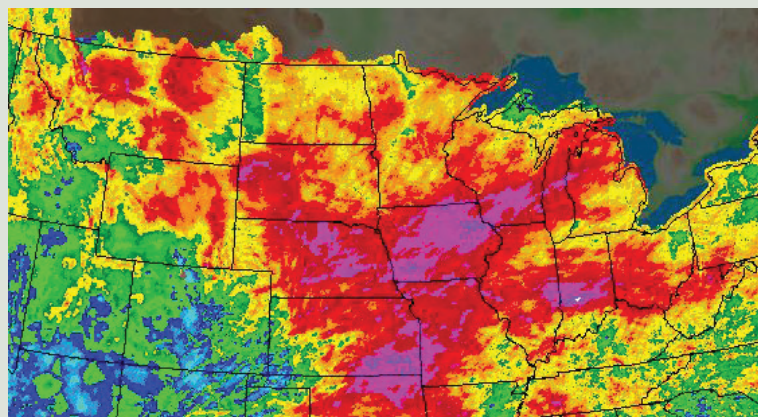


Figure 3: 30-day Observed rainfall ending at 12 UTC June 16, 2008. The red areas denote greater than 5 inches; the purple areas are greater than 10 inches.

which was 3.16 inches on April 12, 1991. The 20 minute record of 1.77 inches (also on April 12, 1991) was broken on May 13 with 2 inches. A total of 6.71 inches fell on May 13 (not breaking the daily record of 8.12 inches from 1908).

Another interesting record event from the NOAA/NWS occurred in Taunton, Mass., regarding Hartford, Conn. During the evening of May 31, 2008, one-half inch diameter hail fell at Bradley International Airport in Windsor Locks from a severe thunderstorm that produced 69 mph winds. The hail, which for climatological purposes is considered snow, resulted in a trace of snow on the ground. This tied a snowfall record for the date. A trace of snow previously fell in 1917. (Records for Hartford began in 1905).

Janice Bunting
Contributing Editor

Figure 1 is courtesy of NOAA/NWS Des Moines, Iowa.

Figures 2 and 3 are courtesy of NOAA/NWS.

Related Sites

Hydrographs from across the U.S.
www.nws.noaa.gov/ahps/

Comparisons between the 2008 and 1993 floods
www.weather.gov/hic/noaawatch/flood1.shtml

Current observed rainfall maps
<http://water.weather.gov>

30 Years of NOAA/NESDIS Operational GOES Satellite Precipitation Estimates

In the mid 1970s, NOAA Satellite and Information Service research meteorologists Dr. Roderick Scofield and Vincent J. Oliver began developing a satellite-based technique for estimating rainfall from convective systems using GOES (Geostationary Operational Environmental Satellite) imagery. After the technique was refined, tested, and evaluated, the Satellite Analysis Branch (SAB) of NOAA began to implement it operationally in 1978. In the early days of satellite precipitation estimation, analysis was quite primitive in comparison to today. The imagery that was used was provided via Unifax machines and was not available until 35 minutes after image time. After two consecutive half hourly images were available, the SAB meteorologist on duty compared and analyzed the hard copy prints on a Light Table. Precipitation estimates were then hand drawn on tracing paper placed over the imagery. Then, a plastic county overlay was placed on top to determine the states and counties affected by heavy rain. By the time the analysis was completed, it would often be as much as 50 minutes (or more) beyond image time. The satellite estimates were then passed along by SAB via telephone (call) to one of the regional NOAA Satellite Field Service Stations (SFSS) who, in turn, passed them along to the pertinent National Weather Service Forecast Office (WSFO). By the time the WSFO received the estimates, the time elapsed could be more than an hour after actual image time. Despite the time lag, the satellite estimates were useful to forecasters in determining how much rain had fallen over areas where rain gauges and/or radar were lacking in coverage.

In 1983, the satellite precipitation estimation process was significantly enhanced with the arrival of the Interactive Flash Flood Analyzer (IFFA). IFFA, a refinement to the University of Wisconsin's Man-computer Interactive Data Access System (McIDAS), enabled SAB meteorologists to display imagery within 5-8 minutes after image time and produce satellite estimates much more quickly. Contours of rainfall estimates were manually drawn on the IFFA each half hour using the Scofield-Oliver Convective Estimation Technique, saved automatically, and stored in files. One hour or multi-hour estimate files could then be displayed as graphics containing rainfall estimate totals overlaid with state and county maps. With the arrival of IFFA, SAB also changed the way satellite estimates were passed along to WSFOs and River Forecast Centers (RFCs). Instead of passing them along via phone calls, SAB composed and disseminated Satellite Precipitation Estimate Messages via the NWS Automation of Field Operations and Services communication system (AFOS) under the header "SPENES". With the use of IFFA and AFOS, satellite estimates were disseminated generally within 20-30 minutes after image time, saving at least 30 minutes compared to the original procedure.

Other changes that occurred in the early to mid 1980's involved the original convective estimation technique itself. The original technique focused upon cold top convection (showers/thunderstorms) with cloud top temps of -62C and lower. A refinement was made to allow for estimation of warmer top convection which, under certain atmospheric conditions, could produce very heavy rainfall as well. Other enhancements included

These graphics represent the three historical stages of GOES Satellite Precipitation Estimates. Figure 1 county overlay was used in the late 1970s to early '80s in conjunction with hard copy imagery.

The Figure 2 was first produced in 1983 with the arrival of the McIDAS-based Interactive Flash Flood Analyzer.

The bottom figure is from the automated Hydroestimator, and was first used operationally in 2002. The original version of automated satellite estimates, the precursor to the Hydroestimator (not shown), was first used in 2000.

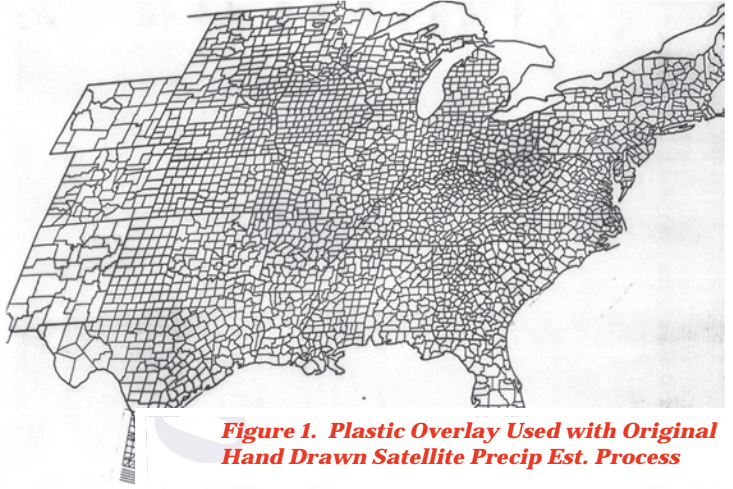


Figure 1. Plastic Overlay Used with Original Hand Drawn Satellite Precip Est. Process

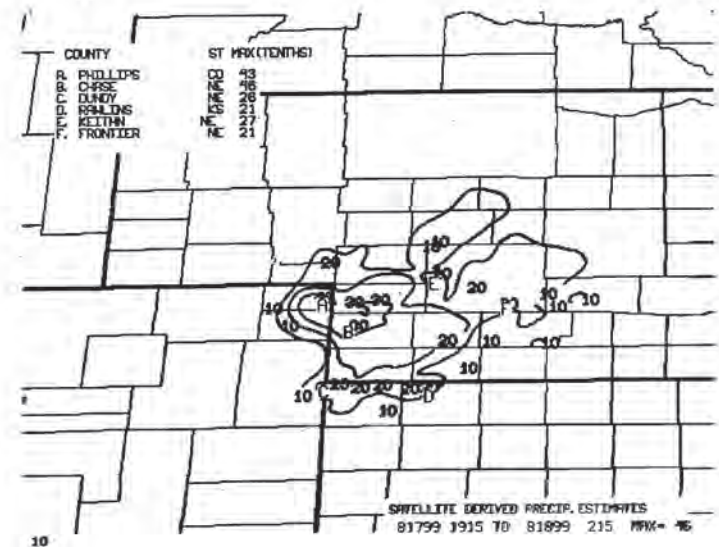
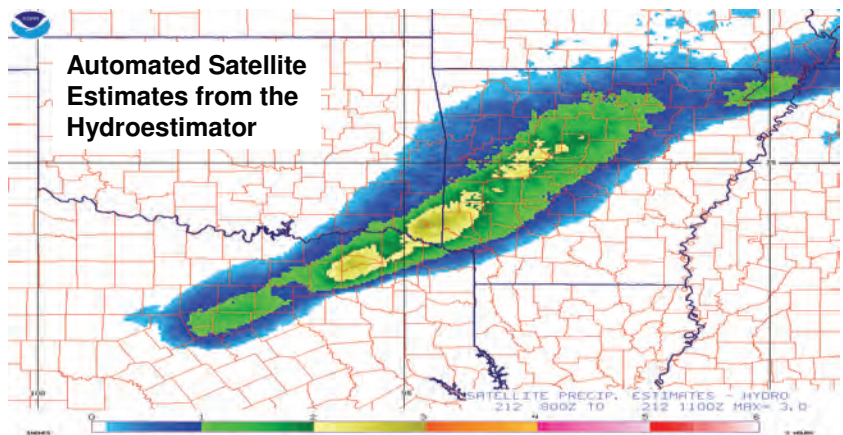


Figure 2. Satellite Estimate Graphic from the (manual) Interactive Flash Flood Analyzer (IFFA)



Continued page 7

Training continued from front

with wildfire detection and monitoring, including weather forecasters, hydrologists, land use managers and researchers.

Access to the module is free, an account is required on the MetEd Web site. Setting an account up takes only few minutes and allows you access to the other valuable documents such as:

- www.meted.ucar.edu/npoess/multispectral_topics/fire_wx/main.htm
- www.meted.ucar.edu/npoess/multispectral_topics/fire_wx/fireProductSuite.pdf
- www.meted.ucar.edu/npoess/multispectral_topics/fire_wx/summary.pdf

This training module has a number of excellent graphics and illustrations, information on products to use during wild fire outbreaks and operational case studies with observations from a National Weather Service forecaster who experienced the fire. In short, you will benefit greatly from reviewing this narrated training module and keeping the product suite and summary documents readily available for the fire season.

Brian Motta
Remote Sensing Committee

GOES continued from left

a satellite precipitation estimating technique for winter storms (rain and snow) and one for estimating rain from tropical systems.

While the introduction of IFFA greatly enhanced the ability to provide satellite estimates to the National Weather Service, it was a very labor intensive process. Thus, when several heavy rainfall events were occurring simultaneously over the continental United States, this process was not conducive to providing coverage for all of the events. As a result, in the mid to late 1990s an automated version of satellite estimates called the Autoestimator (AE) was developed in the Office of Research and Applications (ORA) of NOAA Satellite and Information Service (NOAA/NESDIS). Operational use of the AE began in SAB in 2000. The AE utilized some of the principles of the Scofield-Oliver Technique, but included radar as a rain/no rain discriminator. An alternative version of automated satellite estimates was developed in the early 2000s, the Hydroestimator (HE), used brightness temperature instead of radar to discriminate rain/no rain areas. There were some significant differences between the automated techniques and manual IFFA. For example, factors such as cell mergers and overshooting tops, which were included in manual IFFA estimates, were not included in the automated techniques.

In the current mode of operation in 2008, the SAB precipitation meteorologist on duty determines which of the techniques works best for a given situation, then provides the satellite estimates in conjunction with SPENES messages. In addition to including satellite estimates, SPENES messages also focus upon (satellite) analysis and trends.

Additional research is being conducted with regard to satellite precipitation estimates in preparation for the GOES-R era, leveraging off of different GOES channels as well as the blending of GOES with Polar microwave data.

Charles Kadin
NOAA Satellite and Information Service, Satellite Services Division

Resources for real-time and general information

Real-time automated satellite estimates and information about automated and IFFA techniques, are available at:

- www.orbit.nesdis.noaa.gov/smcd/emb/ff/auto.html
- <http://ams.allenpress.com/archive/1520-0477/79/9/pdf/i1520-0477-79-9-1883.pdf>
- <http://rammb.cira.colostate.edu/visit/hydro.html>

Real-time and archived SPENES messages and information about the SAB precipitation operation are available on Satellite Services Division sites:

- www.ssd.noaa.gov/PS/PCPN/ and
- www.ssd.noaa.gov/PS/PCPN/precip.html, and on the

The NESDIS Convective Precipitation Estimation Technique

- <http://ams.allenpress.com/archive/1520-0493/115/8/pdf/i1520-0493-115-8-1773.pdf>

Professional Development Opportunities

2008 American Association of State Climatologists Annual Meeting: July 7-10

The AASC will hold their Annual Meeting at the Sheraton Burlington Hotel and Conference Center in Burlington, Vt. More information is at www.stateclimate.org.

2008 Air Weather Association Reunion: Aug. 6-10

This reunion will be in Tacoma, Wash. Lodging available at the Best Western Tacoma Dome Hotel — their number is (800) 973-7110. More info is online at www.airweaassn.org or call Don Farrington (cdfcsf@aol.com) or Kevin Lavin (airweaassn@aol.com) for assistance.

12th High Plains Conference: Sept. 4-5

Sponsored by the High Plains Chapter of the AMS/NWA, it will be in Hays, Kan. Submit paper by email to David.L.Floyd@noaa.gov. More info is at www.highplains-amsnwa.org.

12th Annual Great Divide Workshop: Oct. 7-9

The Great Divide workshop will be held in Billings, Mont., and is sponsored by the NOAA/NWS Forecast Offices in Billings and Glasgow. Call (406) 652-0851 or visit www.wrh.noaa.gov/byz/local_news/2008/divideo8.php?wfo=byz for more info.

NWA Annual Meeting: Oct. 11 - 16

The 33rd NWA Annual Meeting will in Louisville, Ky. See page 3 for more.

Our hands are tied: Pay your dues or lose it all!

Haven't paid your dues for this year? You still have time before getting dropped from the roles. We would hate to lose you!

We can't even send you any more newsletters if your membership lags!

There's an easy online option for renewing membership at www.nwa-registration.org. An old fashioned option? Sure! Mail the dues with the renewal form found at www.nwa-registration.org/nationaldues.shtml to the NWA Office!

NATIONAL WEATHER ASSOCIATION
228 W MILLBROOK RD
RALEIGH NC 27609-4304
(919) 845-1546

Stay with us and keep your membership active!



Dates 2 Remember

July 1: NWA Annual Awards nominations due

Aug. 1: Sol Hirsch Education Fund Grant applications due

Sept. 10: Last day for Annual Meeting's hotel group rates

Oct. 3: End of preregistration for Annual Meeting

Oct. 11-16: 33rd NWA Annual Meeting, Louisville, KY

See page 7 or www.nwas.org/events.php for details on these and additional Professional Development Opportunities!

NWA Newsletter (ISSN 0271-1044)

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Editor and Publisher: Steve Harned, Executive Director

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Submit newsletter items directly to the NWA office or to nwanewsletter@nwas.org. Material received by the 25th will be considered for the next month's issue.

Members receive the Newsletter and *National Weather Digest* as part of their regular, student or corporate membership privileges. Newsletter subscriptions are available for \$18 per year plus extra shipping costs outside U.S. Single copies are \$1.50. Please send address, phone number, email and affiliation changes to assist@nwas.org.

Supporting and promoting excellence in operational meteorology and related activities since 1975.

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