

# What Do You Do With It Now That You Have It? The Impact of Web Weather and Climate Information

by Steve Hardin

*Steve Hardin is associate librarian, Cunningham Memorial Library, Indiana State University, 2291 Idaho Street, Terre Haute, IN 47803-3837; e-mail: shardin@indstate.edu*

It's trite but true: people from nearly every walk of life are both posting and using the information available on the World Wide Web. Uses range from recreation to commerce to education to research. Included in that research area are thousands of sites that deal with meteorology and climatology. The exact number of related sites is difficult to pin down – it is constantly changing – but a search on the Google search engine (www.google.com) for “meteorology or climatology” yielded about 352,000 hits in January of 2003. Weather and climate information is now vastly easier to obtain than it was only a decade ago. Material that once had to be slowly printed out on a telefacsimile or even received through the mail with a paid subscription to a service is now quickly (and in many cases freely) available on the Web.

What impact has this glut of information had on the practice of the two disciplines of meteorology and climatology? To find out, I interviewed 10 researchers and practitioners in the field: two national Weather Service meteorologists, two broadcast meteorologists, two volunteers from the SKYWARN ham radio storm-spotting network, two academic faculty members and two employees of government-sponsored climatology centers. Each respondent was asked the following five questions aimed at determining their use of and attitude toward weather and climate information on the Web:

- Do you make use of weather/climate information on the World Wide Web as part of your professional duties?
- Which are your top three favorite sites? Why?
- Do most of your colleagues also use the Web for weather/climate information?
- What has been the overall impact of the

increased availability of weather/climate information?

- Overall, would you say the impact has been good or bad for the profession? Why?

While the questions for the most part elicited usable responses, combining the responses to a couple of the questions provided a better flow when discussing the results of the survey.

## Use of the Web

Every respondent reported using the weather and climate data available on the Web. However, there was a clear dichotomy on how the data was used. Broadcast meteorologists, SKYWARN volunteers and faculty members all said they were consumers of the data available; National Weather Service meteorologists and those who worked for climate data centers said they did not use the Web very much to create their products. They produce as well as consume data, putting up information on their own websites.

For example, Jason Puma, NWS Forecast Office in Indianapolis, said the people in his office do not use the Web very much for forecasting. They have their own sources, such as the Advanced Interactive Weather Processing System (AWIPS), which allow them to generate forecasts and view models without using the Web. However, he said, the Web is good as a backup.

On the other hand, the SKYWARN volunteers use the Web extensively during severe weather outbreaks. Douglas Childs, a net control operator and trainer for North Alabama SKYWARN, said he uses radar data and the sites that have warning texts to stay on top of developing weather situations. Gary Wheeler, coordinator for Illiana SKYWARN,

## Overall, the respondents agree the impact of the increased availability of weather and climate information on the Web is good.

a regional ham radio storm spotter network based in the Terre Haute area, also uses the Web for updates on breaking weather.

The broadcast meteorologists also make extensive use of the Web. Both Kirk Melhuish of WSB-AM in Atlanta and Ed Kieser of WILL-AM in Urbana, Illinois, said the Web is a valuable source of information, both for real-time weather data and for model guidance in producing forecasts. Like the government meteorology and climatology employees, they use the Web to disseminate information as well.

The faculty members use the Web, too. Dr. Cary Mock of the University of South Carolina said he uses it in research to get data and in teaching to obtain real-time weather maps and satellite images. Marion Alcorn of Texas A&M University said he accesses the Web both for personal use and to have his students look at weather maps as part of their laboratory exercises.

### Favorite Websites

There was a wide range of responses when respondents were asked to name their favorite websites. Al Wallis, meteorologist and data consultant for the National Climatic Data Center in Asheville, North Carolina, says he does not rely on other websites in his work. Instead, he and his colleagues take data such as observations from other sites and mount them on the NCDC site at <http://lwf.ncdc.noaa.gov/oa/ncdc.html>. Steve Hilberg, director of the Midwestern Regional Climate Center (MRCC), contributes to the MRCC website (<http://mcc.sws.uiuc.edu/>), but he also uses the College of DuPage site (<http://weather.cod.edu>) because it has a nice models page that emphasizes the situation in the Midwest. He also uses the National Weather Service's Interactive Weather Information Network (<http://iwin.nws.noaa.gov>), as well as the UCAR RAP site ([www.rap.ucar.edu/weather](http://www.rap.ucar.edu/weather)), because it has good satellite and surface data. In addition, he makes use of the NWS Lincoln, Illinois, radar site ([www.crh.noaa.gov/radar/latest/DS.p19r0/si.kilx.shtml](http://www.crh.noaa.gov/radar/latest/DS.p19r0/si.kilx.shtml)).

Among the NWS meteorologists, Puma says he sometimes uses the Intellicast site ([www.intellicast.com](http://www.intellicast.com)) for current radar information, especially if he is at home and lacks access to his work resources. David Toronto, Warning Coordination Meteorologist at the NWS office in Salt Lake City, says the various NWS sites are the most heavily used in his shop. They also frequently use the University of Utah site ([www.met.utah.edu/](http://www.met.utah.edu/)) which has a link to a mesoscale observation network called Meso West ([www.met.utah.edu/mesowest](http://www.met.utah.edu/mesowest)). The data there is collected by the University of Utah; the NWS

staffers FTP it into their own website. In addition, he uses the Climate Prediction Center site at [www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov) for information on El Niño and other hot topics.

The SKYWARN volunteers favor sites with late-breaking weather information. Wheeler frequently uses the Intellicast Lincoln, Illinois, radar summary ([www.intellicast.com](http://www.intellicast.com)) because it gives him the storm location, direction, cloud tops and watch boxes. He also uses the NWS short-range base reflectivity radar site for Lincoln ([www.crh.noaa.gov/radar/latest/DS.p19r0/si.kilx.shtml](http://www.crh.noaa.gov/radar/latest/DS.p19r0/si.kilx.shtml)). It updates about every six minutes, something he said "we've prayed for for years." In both cases, he prefers the Lincoln radar site to the one in Indianapolis; he wants to see what is coming rather than what has already passed.

Alabama's Childs uses a commercial provider, WeatherTAP ([www.weathertap.com/](http://www.weathertap.com/)) to keep track of storms through radar data. In addition, he uses EMWIN technology (explained via <http://iwin.nws.noaa.gov/emwin/index.htm>) to pull down weather information from the Internet. He also uses the Storm Prediction Center's site ([www.spc.noaa.gov](http://www.spc.noaa.gov)) to check the convective outlooks to tell him when severe weather may develop. He uses these sites "because they provide the information I need and are easily accessed."

The broadcast meteorologists also make heavy use of the NWS weather sites. WSB-AM's Melhuish uses the Storm Prediction Center site mentioned earlier. He also likes the Quantitative Precipitation discussion page ([www.hpc.ncep.noaa.gov/discussions/qpfpfd.html](http://www.hpc.ncep.noaa.gov/discussions/qpfpfd.html)). In addition, he visits a number of university sites, especially the Ohio State University (<http://twister.sbs.ohio-state.edu/>) which he uses because it has the various Model Output Statistics (MOS) data and forecast discussions easily available from a single page. He said he visits the OSU site every day. He also uses the SUNY Brockport site ([www.weather.brockport.edu/](http://www.weather.brockport.edu/)) daily. In addition, he finds the Penn State weather site valuable. A professor there has a site named "Eyewall" (<http://eyewall.met.psu.edu>) which features a lot of information on a single page. WILL Radio's Kieser says he visits many sites, and the ones he uses change all the time. He said he uses the National Centers for Environmental Protection (NCEP) site ([www.ncep.noaa.gov/](http://www.ncep.noaa.gov/)) because it puts out models faster and farther out than ever before; he said it is even faster than the UNISYS site (<http://weather.unisys.com>). His second favorite site is the RAP site mentioned earlier which has "lots of good data presented well." He also uses the Storm Prediction Center's site, especially its interactive map.

The faculty members had a somewhat different set of priorities. Texas A&M's Alcorn says the UNISYS site is his favorite – its weather maps are easy to read. He also likes the NWS Southern Region Headquarters city forecast page ([www.srh.noaa.gov/hgx/](http://www.srh.noaa.gov/hgx/)). It “provides a forecast for the local area for a week in advance and the page is nicely laid out.” South Carolina's Mock differentiates between the sites he uses for research and those he uses for teaching. In the first category, he likes the Climate Diagnostics Center ([www.cdc.noaa.gov/](http://www.cdc.noaa.gov/)), which he calls a great website “for quickly constructing synoptic and regional climate maps at the research level.” He also uses the National Climatic Data Center site; he said it is the main website for getting climatic data for the United States as well as for other parts of the globe. In addition, the NWS Tropical Prediction Center site ([www.nhc.noaa.gov](http://www.nhc.noaa.gov/)) is good for “following hurricanes and tropical storms.” In the second category, Mock prefers the Real Time Weather Data site at the previously mentioned National Center for Atmospheric Research, as well as the UNISYS site and the Weather World 2010 Project at the University of Illinois ([http://ww2010.atmos.uiuc.edu/\(Gh\)/home.xml](http://ww2010.atmos.uiuc.edu/(Gh)/home.xml)). He says this site “is great for introductory college and secondary teaching concerning basic weather concepts.”

A summary of the websites mentioned, sorted by frequency of mention during the interviews, is presented here.

Times Mentioned	Name and URL
4	Storm Prediction Center – <a href="http://www.spc.noaa.gov/">www.spc.noaa.gov/</a>
3	RAP – <a href="http://www.rap.ucar.edu/weather">www.rap.ucar.edu/weather</a>
3	UNISYS – <a href="http://weather.unisys.com">weather.unisys.com</a>
2	Intellicast – <a href="http://www.intellicast.com">www.intellicast.com</a>
2	National Climatic Data Center - <a href="http://lwf.ncdc.noaa.gov/oa/ncdc.html">http://lwf.ncdc.noaa.gov/oa/ncdc.html</a>
2	NWS Short-range base reflectivity for Lincoln, IL – <a href="http://www.crh.noaa.gov/radar/latest/DS.p19r0/si.kilx.shtml">www.crh.noaa.gov/radar/latest/DS.p19r0/si.kilx.shtml</a>
1	Climate Diagnostics Center - <a href="http://www.cdc.noaa.gov/">www.cdc.noaa.gov/</a>
1	Climate Prediction Center – <a href="http://www.cpc.ncep.noaa.gov">www.cpc.ncep.noaa.gov</a>
1	EMWIN – via <a href="http://iwin.nws.noaa.gov/emwin/index.htm">iwin.nws.noaa.gov/emwin/index.htm</a>
1	Eyewall – <a href="http://eyewall.met.psu.edu">eyewall.met.psu.edu</a>
1	IWIN – <a href="http://iwin.nws.noaa.gov/">iwin.nws.noaa.gov/</a>
1	Meso West – <a href="http://www.met.utah.edu/mesowest">www.met.utah.edu/mesowest</a>
1	NCEP site - <a href="http://wwwt.ncep.noaa.gov/">wwwt.ncep.noaa.gov/</a>
1	NWS Southern Region Headquarters – <a href="http://www.srh.noaa.gov/hgx/">www.srh.noaa.gov/hgx/</a>
1	NWS Tropical Prediction Center - <a href="http://www.nhc.noaa.gov">www.nhc.noaa.gov</a>
1	Quantitative Precipitation discussion – <a href="http://www.hpc.ncep.noaa.gov/discussions/qpfdfd.html">www.hpc.ncep.noaa.gov/discussions/qpfdfd.html</a>
1	Ohio State University – <a href="http://twister.sbs.ohio-state.edu">twister.sbs.ohio-state.edu</a>
1	SUNY Brockport – <a href="http://www.weather.brockport.edu/">www.weather.brockport.edu/</a>
1	University of Utah weather site – <a href="http://www.met.utah.edu">www.met.utah.edu</a>
1	Weather World 2010 Project – <a href="http://ww2010.atmos.uiuc.edu/(Gh)/home.xml">ww2010.atmos.uiuc.edu/(Gh)/home.xml</a>
1	WeatherTAP - <a href="http://www.weathertap.com/">www.weathertap.com/</a>

## Impact of the Information on the Web

Overall, the respondents agree the impact of the increased availability of weather and climate information on the Web is good. This perception is especially strong among those who produce as well as consume Web information. Wallis, Hilberg, Puma and Toronto agree an important aspect of the Web's usefulness lies in information dissemination. Puma notes the National Weather Service's mission is to “protect life and property” of the citizenry; anything that helps the NWS “get the word out” is good and the Web is great for this task.

On a related note, the Web is supplanting the telephone as an important means of disseminating information. For the forecaster and data provider, a desirable side effect of this occurrence is an accompanying reduction in the number of phone calls to their offices. Hilberg said the number of calls to his office peaked in 1997. Interruptions are rarer and generally take less time. Puma notes that he can often refer a caller to the appropriate Web site, walk the caller through the information retrieval process once and then not have to worry about being interrupted by that caller again. Hilberg says many of the people who call his office now are people who need “certified” information or other data not readily available on their website. (This writer notes parenthetically that a number of websites consulted for this paper seemed designed to make telephone contact numbers rather difficult to find – perhaps an effort to shift more of the contact from the telephone to the Web.)

The broadcast meteorologists also appreciate the reduction in interruptions from listeners; they too can often refer callers to websites. In addition, the convenience of the data's availability makes it possible for them to do their jobs more efficiently. Melhuish notes that without the Web, he would need to constantly run from his office in the radio station to the weather center in WSB-AM's companion television station to get his data. There is a downside to all this data, however, in the form of information overload. Melhuish notes “you can look at 23 or 24 competing models and never decide what the best forecast is until it's too late!” Kieser reports his biggest problem 15 years ago was a lack of data; that's no longer the case. Both broadcast meteorologists say they appreciate getting international weather information too – it comes in handy when someone wants a forecast for overseas.

SKYWARN volunteers say the Web helps them and the general public stay abreast of weather developments. Wheeler notes that there was a time when everyone had to rely on local television stations for radar. The advent of the Weather Channel improved the situation a bit. But the Web allows people to find the particular information they want. Childs echoes the usefulness of getting one's own information. “It makes decisions to shut down the nets when appropriate easier since we have the data to look at ourselves.” Weather net control operators and

spotters, he says, are better informed thanks to the Web. "When I can say 'Spotters in area X, the cell of concern will be in your area in five minutes,' it lets people concentrate on spotting rather...[than] checking with the TV..."

Academics praise the Web for making more information available faster. "Worldwide, nearly real-time weather information is more readily available for use in the classroom," says Alcorn. On the other hand, he says the impact of the Web has not been good in all areas "because there is a lot of undesirable information being spread around." Mock agrees: "Sometimes data is not properly screened for quality before being on the Web." He adds that good researchers can usually tell good data from bad, and most of the major agencies such as the National Oceanic and Atmospheric Administration do good quality control. He also says the Web has "raised expectations in teaching in terms of access to more detailed information." He goes on to say the Web "has taken away the more traditional manual lab component in meteorology ... [such as] drawing weather maps...replacing it with the computerized aspects and...expectations to do more rigorous number crunching[.]...In climate research, it has increased the scope of 'expected' research articles in publication...there are more big regional/global datasets [available now]..."

### Conclusions and Future Research

Persons interviewed say the development of the World Wide Web has had a profound impact on the way climatologists, meteorologists and other people who deal with weather do their jobs. For the most part, this impact has been very positive. Respondents agree that the Web makes possible the production of weather forecasts that are both more accurate and timelier. And while no one interviewed for this paper explicitly stated it, this writer suspects a better understanding of the mechanisms of climatology has resulted from the ready availability of larger, more extensive data sets. The Web has also enhanced public safety by permitting better informed storm spotting and more rapid dissemination of emergency information.

Several avenues for follow-up research present themselves. It would be interesting to take the more traditional approach mentioned earlier in this paper and conduct a more formal survey with a verifiable instrument distributed to many more subjects. A more random sample could increase the confidence that the results represent the beliefs of practitioners in the field and enable a more rigorous statistical analysis. In addition, this writer notes that every respondent in this survey was male. It could be useful to assess any gender differences in Web use and perceptions of its impact.

The **BULLETIN OF THE AMERICAN SOCIETY FOR INFORMATION SCIENCE AND TECHNOLOGY** is a **BIMONTHLY PUBLICATION** that serves as the newsletter of the Society. It publishes short articles on a **BROAD RANGE OF TOPICS** of current concern to **ASIST MEMBERS**, focusing particularly on material of interest to practitioners. Readers are **ENCOURAGED TO SUGGEST** topics of interest or alert the Editor of suitable material that may have been presented at **ASIST-sponsored events or elsewhere**. In addition, authors are **ENCOURAGED TO SUBMIT** articles on topics such as **CURRENT PRACTICE, PUBLIC POLICY, LEGISLATION, STANDARDS, PILOT PROJECTS, STATE-OF-THE ART REVIEWS or OVERVIEWS OF EVOLVING TECHNOLOGY AND ITS IMPACT**. Articles informing the membership about various developments within **ASIST** are very welcome, as are articles reporting on **ACTIVITIES OUTSIDE THE UNITED STATES**. The *Bulletin* encourages original articles, but will consider **TIMELY MATERIAL** that has been presented or published elsewhere. Articles are posted in full on the **ASIS Web Site** at <http://www.asis.org/Bulletin/index.html>

Authors interested in developing material for a focused issue are urged to contact the Editor directly.

Authors are encouraged to discuss article ideas with the Editor if there are questions about suitability or relevance.

**Irene L. Travis, Editor**  
*Bulletin of the American Society for Information Science and Technology*  
1320 Fenwick Lane,  
Silver Spring, MD 20910  
(301) 495-0900  
[Bulletin@asis.org](mailto:Bulletin@asis.org)