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Editorial

"The Other Y2k Problem"

Happy New Year! We are just about to close the book on the 1900s. But as everyone knows by now, all is not champagne and countdown clocks. The so-called "Y2k problem" associated with two-digit dates in computer codes has been implicated as a vulnerability in systems from electric power to aviation. Fortunately, the issue has received plenty of attention (not to mention hype!) and we are thus assured [www.pub.whitehouse.gov/urires/I2R?urn:pdi://oma.eop.gov.us/1999/11/10/8.text.1] that the calendar should turn over with few if any problems in the United States.

But there lurks an issue that some have taken to calling "the other Y2k problem" – the maximum in the solar cycle expected to occur next year. The sun is not a constant source of energy like a light bulb. It is in some ways more like a candle in that at times it "flickers." Scientists have discovered through observations over hundreds of years that the sun actually changes its behavior over an 11-year "solar cycle." Solar Maximum is the time during the eleven-year solar cycle when the sun is most active. And it is considered to be more of a problem now than ever before because of the rapid proliferation of technologies--like satellites and cell phones – that are potentially vulnerable to solar activity.

According to the National Oceanic and Atmospheric Administration (NOAA) [www.noaanews.noaa.gov/stories/s317.htm] it is solar activity -- solar flares, coronal mass ejections and other solar phenomena [www.sec.noaa.gov/info/glossary.html] – that causes "the stormy weather of space." Space weather can affect the earth at any time, but is most threatening during the Solar Maximum when there is "an increase in the number and intensity of solar events, which can cause impacts on Earth such as electrical power outages, satellite failures, and radio and navigation problems."

Fortunately, like the more widely known Y2k problem, there has been significant effort with respect to space weather. Within NOAA, the Space Environment Center in Boulder, Colorado [www.sec.noaa.gov/] is an important, but little known organization that focuses explicitly on "space weather." Its mission is "to synthesize and disseminate information about past, present, and future conditions in the space environment for space weather users and private industry vendors . . . to conduct research and develop techniques that improve monitoring and forecasting . . . [and] to advise and educate those who operate systems affected by disturbances in the space environment." NOAA

About Us

WeatherZine is a bimonthly newsletter on the societal aspects of weather. It contains opinion pieces, news, and a brief summary of developments at the *Societal Aspects of Weather* Web site.

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<http://www.dir.ucar.edu/esig/socasp/zine>

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recently issued a standard scale for the issuance of warnings about space weather events. [www.spaceweather.noaa.gov/stories/solarscales.html] Like the more familiar Saffir/Simpson hurricane scale or the earthquake Richter scale, users expect that "NOAA's new space weather scales will significantly aid the space industry in anticipating events, understanding effects, and developing more robust satellite designs and mitigation strategies."

While on the one hand it is reassuring that people are addressing the space weather issue, on the other hand there is more work to be done. Little is actually known beyond anecdotes about the economic and other societal impacts of space weather, much less about the use and value of space weather forecasts and warnings. An important linkage between users and producers of space weather information has been made in the creation of a "Customer Focus Group" [www.sec.noaa.gov/] within the Space Environment Center, as well as its User Conferences during its annual "Space Weather Week." [www.sec.noaa.gov/] But no one is actually conducting research on space weather impacts or on decision making in response to those impacts.

As frequent readers of the WeatherZine will note, the challenge of understanding impacts and forecast value requires action beyond addressing the need – indeed, a critically important need -- to bring together producers and users of space weather information. [See www.dir.ucar.edu/esig/prediction/index.html, and uswrp.mmm.ucar.edu/uswrp/PDT/PDT6.html] And of course the paucity of "user-centered" research is not unique to this issue – the nation's climate and weather forecast systems suffer from similar neglect of these important areas. In the case of space weather the consequences are equally similar: policymakers lack information with which to prioritize funding for space weather versus other demands in a tight federal science budget, many potential users of space weather information do not clearly understand their own vulnerabilities, forecasts are produced with little systematic knowledge of their use, misuse, or value, and some debate whether the federal government should even play a (non-military) role in space weather.

And just as in weather and climate, lack of understanding of these issues will likely impede both the progress of science and the usefulness of forecasts and other products to users. With good luck, this "other Y2K" problem will pass as uneventfully as is expected of the original. However, we should also be prepared for potential surprises that might result from our lack of systematic attention to the vulnerabilities associated with space weather and the role of information in becoming more resilient.

For more information, see the links at:

www.sec.noaa.gov/info

www.sec.noaa.gov/sources.html

--Roger A. Pielke, Jr.

**How Well Did the 1999 Hurricane Season Forecasters Do?
(Pretty good! Check out these links)**

- William M. Gray, Christopher W. Landsea, Paul W. Mielke, Jr. and Kenneth J. Berry -- typhoon.atmos.colostate.edu/forecasts/1999/nov99/
- National Oceanic and Atmospheric Administration-- www.noaanews.noaa.gov/stories/s329.htm
- The Tsunami Initiative--www.nerc-bas.ac.uk/public/tsunami/projects_public/tcfp/June-01.pdf

Guest Editorial

**The Future of the "Public-Private Partnership"
Toward a More Synergistic Relationship in the 21st Century**

In recent months, the meteorological community finds itself debating the mission of the National Weather Service, including its relationship with private sector meteorology. In the United States, weather information is provided to citizens, business and governmental entities through a mix of National Weather Service and private sector meteorologists, the latter of which includes media meteorologists, in-house corporate meteorologists and commercial weather companies.

In attempting to find the optimal roles for the National Weather Service and private meteorology, a useful analogy for the field of meteorology is the provision of security. We depend on our government to protect us from threats, be they foreign or criminal. We assign this responsibility to our military and police, respectively. Using this analogy, the citizens of the United States could reasonably expect the government to provide protection from weather "threats." If one agrees with this analogy, warnings of hazardous weather for the general

public and the infrastructure needed to create those warnings would be a legitimate governmental function.

Yet many businesses, and some individuals, feel they need police services above and beyond what are provided by government. For them, there is a private security industry that ranges from entire industrial police and fire departments to private security companies to alarm services. These private agencies generally coordinate with government-provided police services. The private security industry is not just site-specific (i.e., a burglar alarm), it is also event-specific.

Consider the Professional Golf Association's Kemper Open. It hires private security for crowd and traffic control since the ordinary level of police service is inadequate to handle events of this nature and size. Similarly, if tournament organizers believe the meteorological service provided by, for example, NOAA Weather Radio, is inadequate, they should pay for private "weather security."

Private sector meteorology dates to the 1940s, and tornado warnings, color radar, and in-home agricultural weather displays are just a few of its many contributions. Today, the private sector weather industry in the United States is increasingly sophisticated, providing a wide variety of services. These range from pavement-based computer models for fighting winter storms, track-specific storm warnings for railroads, and helicopters and automobiles equipped to chase tornadoes and broadcast live video. Commercial weather companies use state-of-the-art technology comparable to, and, in some cases, exceeding that available to National Weather Service field offices. Since the clients of these companies pay fees for the services received (when they could use free services from the government or media) and, since the private sector is growing rapidly, one may conclude there is a generally high level of satisfaction with the services provided by commercial weather companies.

Occasionally, our colleagues in the National Weather Service will assert it is "unfair" for private sector meteorologists to prosper by "repackaging" their work. I disagree with this assertion. For example, the private sector weather industry is the *only* "customer" of the National Weather Service that pays the incremental cost of the service it receives from the NWS. We pay "user fees" for the Domestic Data Service, WSR-88D data, and other services. The public does not pay a user fee for NOAA Weather Radio. While some "repackaging" of NWS products does occur in commercial meteorology, most commercial weather companies create their own forecasts and add value in other ways. At WeatherData, Incorporated (www.weatherdata.com) we go beyond creating our own forecasts and provide specialized storm warnings, both synoptic and mesoscale, for our

clients. But, even if a forecast is repackaged, there is nothing inherently wrong with that. In a capitalistic economy, a role of government is to create opportunity for the private sector. We see this in many industries such as commercial aviation. The commercial airlines use the air traffic control system as a part of their business. No one proposes the Federal Aviation Administration create an airline simply because it provides infrastructure.

Infrastructure is at the center of this debate. There are more than 100 private sector weather radars, many of which produce external data that is more timely than the WSR-88D's. Private sector environmental satellites are being planned. Private sector companies are running meteorological models. States and television stations are creating mesonetworks. Virtually all of this non-federal data eventually will be available through the Internet or other communications systems to meteorologists of all types. The National Weather Service could provide valuable leadership and facilitate the integration of all of these non-federal sources into our nation's meteorological database, which would allow the whole to be much more than the sum of its parts. But, will it?

History is not encouraging. In the 1950s, the Weather Bureau discouraged Oklahoma television stations from broadcasting tornado warnings. And, as incredible as it seems today, in the 1970s the NWS attempted to restrict real-time weather satellite data and in the 1980s blocked the interstate distribution of tornado warnings and certain types of guidance. Even in the 1990s, with both the Public-Private Partnership Statement (www.nws.noaa.gov/im/a06toc.htm) in place and the Paperwork Reduction Act, the NWS still does not distribute its entire output to the private sector on the same complete and timely basis as it does internally. Some in the NWS apparently want the agency to duplicate the same services to business as private sector weather companies even though it has neither the resources nor policy authorization to do so.

I believe the optimal role for the National Weather Service is to provide infrastructure (including observations, modeling, and research) plus hazardous weather warnings and the current level of weather forecasts for the general public. Because of existing law and treaty obligations, the NWS should continue to provide current aviation and marine forecasts and warnings. *All other meteorological services should be provided by the private sector.* The NWS should consider the media, emergency managers, and commercial meteorologists as its *primary and most important customers.*

This change in mission and mindset would allow the NWS to enhance its importance in the new century and

better leverage the taxpayers' investment. A narrower mission would focus NWS resources on collecting more and better data and excellence in hazardous weather forecasts and warnings. Private sector meteorologists, freed of the threat of unfair (tax-supported) competition, would become the National Weather Service's strongest champions as our interests much more closely align. I believe this vision would benefit the National Weather Service, the commercial weather community, the national economy, and most importantly, American society.

--Michael R. Smith

Certified Consulting Meteorologist
President
WeatherData, Incorporated
Wichita, Kansas

Comments? thunder@ucar.edu

Correspondence

We encourage your correspondence, and although we cannot print all that we receive, we will include at least one short, perhaps edited, letter per issue.

Dear WeatherZine,

In response to Jerry Jarrell's discussion (April 1999 Weatherzine, "What Does the National Hurricane Center Need from Social Scientists?")
[\[www.dir.ucar.edu/esig/socasp/zine/15.html#2\]](http://www.dir.ucar.edu/esig/socasp/zine/15.html#2):

From the perspective of New Jersey's Hurricane Program Manager, I submit the following priorities:

1. Issuance of an official confidence factor. When the National Hurricane Center (NHC) issues each advisory and accompanying discussion statement, there are varying degrees of detail regarding just how confident it is in its prediction. I would like to see this expanded to a good level of detail and then standardized. Even a mathematical coefficient could be developed and issued for the storm, say on a scale of 1-5 out to one decimal place. With this added to our arsenal, planners like me would have something more to go on than simply a forecast track on a map. This is the missing link between the minds of the scientists in Miami, and the planners in the field who are using the advisories to make (or not make) things happen.

2. In the USACOE restudies, add a standard element to include the development of last refuge evacuation planning. This goes along with the above recommendation somewhat in giving the state and local planners another option for use with storms that are not

"behaving", and therefore a timely evacuation recommendation cannot realistically be made. Develop a set of traffic flow analyses which would track an approaching tropical storm wind field which eventually overtakes the tail end of an evacuation and then identify shelters that could be used to get the people to safety as a storm passes. This was used in Florida for Opal (I believe) and probably saved a number of lives. For those storms where we intentionally allow the "zero hour" to go by without starting an evacuation, we know that we could strand a certain number of vehicles, and we need to have a formal and equally viable "Plan B" to cover them. Right now, I'd bet that almost all planners delay pushing the button to get one or even two more advisories in the hope that the subsequent discussions give a better confidence to the forecast track and justify an order to evacuate.

3. Have the insurance companies that are helping to build more resistant houses develop a standard booklet for prospective house buyers who will be building from scratch. It would cover not only safety, but insulation, utilities, siding, roofing, flooring, etc. Everyone wins because the builder always adds a percentage of overhead to the cost of the options.

--Mike Augustyniak

Weather-Related News

Recent additions to the Societal Aspects of Weather Weather Policy Section—"Weather Budgets"--
www.dir.ucar.edu/esig/socasp/policy.html#budgets
--include a series of graphs showing federal weather expenditures between 1979 and 1998 for the National Science Foundation's Mesoscale Dynamic Meteorology and Meteorology/Physical Meteorology divisions, six main agencies of the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM), all federal weather research and operations combined, and total federal weather expenditures. The graphs also portray each year's budget as a multiple of the 1979 budget for each agency or function. Pie charts show the relative percentages of 1998 expenditures that each NSF division represents, and the percentages of the overall 1998 OFCM budget that the five largest OFCM agencies represent. A stacked percentage chart shows the relative percentage of the 1979-98 weather budgets represented by weather research and by operations. "Research" includes OFCM supporting research, NSF's Mesoscale Dynamic Meteorology and Meteorology/Physical Meteorology divisions, and the National Center for Atmospheric Research (NCAR)'s Mesoscale and Microscale Meteorology Program. "Operations" includes OFCM's operations.

Two new books available from Island Press:

The Hidden Costs of Coastal Hazards: Implications for Risk Assessment and Mitigation, by The H. John Heinz III Center for Science, Economics, and the Environment (Island Press November, 1999).

Society has limited hazard mitigation dollars to invest. Which actions will be most cost effective, considering the true range of impacts and costs incurred? In 1997, The Heinz Center began a two-year study with a panel of experts to help develop new strategies to identify and reduce the costs of weather-related hazards associated with rapidly increasing coastal development activities.

The Hidden Costs of Coastal Hazards presents the panel's findings, offering the first in-depth study that considers the costs of hazards to natural resources, social institutions, business, and the built environment. Using the case study of Hurricane Hugo, which struck South Carolina in 1989, it provides for the first time information on the full range of economic costs caused by a major coastal hazard event.

The book describes and examines unreported, undocumented, and hidden costs such as losses due to business interruption, reduction in property values, interruption of social services, psychological trauma, damage to natural systems, and others; examines the concepts of risk and vulnerability; discusses conventional approaches to risk assessment and the emerging area of vulnerability assessment; recommends a comprehensive framework for developing and implementing mitigation strategies; documents the impact of Hurricane Hugo; and provides insight from some of the survivors (description from the Heinz Center Web site, www.heinzctr.org/).

Disasters and Democracy: The Politics of Extreme Natural Events, by Rutherford H. Platt et al. (Island Press 1999).

In recent years, the number of presidential declarations of "major disasters" has skyrocketed. Such declarations make stricken areas eligible for federal emergency relief funds that greatly reduce their costs. But is federalizing the costs of disasters helping to lighten the overall burden of disasters or is it making matters worse? Does it remove incentives for individuals and local communities to take measures to protect themselves? Are people more likely to invest in property in hazardous locations in the belief that, if worse comes to worst, the federal government will bail them out? *Disasters and Democracy* addresses the political response to natural disasters, focusing specifically on the changing role of the federal government from distant observer to immediate responder and principal financier of disaster costs (description from the Island Press Web site, www.islandpress.org/books/bookdata/disasdem.html).

To order either book:

www.islandpress.org/books/order/order.html

We are currently in the process of upgrading the search service for The Forecast Use and Value Bibliography (WeatherZine Number 18, October 1999, www.dir.ucar.edu/esig/socasp/zine/news.html#biblio). Look for this new search capability to appear soon in the bibliography. We apologize for any inconvenience caused while the current search engine is down, but we hope this new web-based bibliographic software will provide a better service to users. Please direct any comments or questions about the new search service to oxelson@ucar.edu.

Selected Web Site Additions

Hurricanes

www.cla.sc.edu/geog/faculty/carbone/tropcycl/
Tropical Cyclones

The destructive power of a tropical cyclone instills fear in those in its path and intrigues atmospheric scientists interested in its dynamics. This Web site guides the viewer through the formation, structure, energy, and movement of tropical cyclones by using sketches, radar and satellite imagery, and animations

Emergency Management

www.fema.gov/impact/impact0.htm
FEMA's Project Impact

The Federal Emergency Management Agency's Project Impact helps communities protect themselves from the devastating effects of natural disasters by taking actions that dramatically reduce disruption and loss. With Hurricanes Dennis, Floyd, and Irene, there have been many opportunities recently to highlight "lessons learned" in terms of disaster prevention in both Project Impact and non-Project Impact communities. Examples of disaster mitigation projects represent a large portion of the examples now on-line.

Emergency Management

www.state.gov/www/issues/relief/gdin.html
The Global Disaster Information Network (GDIN)

The Global Disaster Information Network's purpose is to make needed information for conducting effective disaster relief operations available via the Internet. This U.S. Department of State Web page provides

information about past and future international meetings devoted to creating the GDIN.

Weather Policy

www.nws.noaa.gov/om/myers/jm.htm
Vision of Future Weather Services

The October 5, 1999 speech of Dr. Joel Myers to the NWS concerning his views on the future of U.S. weather services.

General Weather Resources

www.cpc.ncep.noaa.gov/products/predictions/threats/threats.html

NOAA's U.S. Threats Assessments

U.S. Threats Assessment covers short-term (3-5 days), medium-range (6-10 days), and long-range forecasts. This page includes North American maps showing projected temperature/wind, precipitation, and soil/wildfire anomalies. Other information--such as a table of rivers currently at or above flood stage--is also included.

General Weather Resources

www.fema.gov/media/
Federal Emergency Management Agency Media Web site

JOBS

Director, Weather and Air Quality Research National Oceanic and Atmospheric Administration

Open Period: 10/27/1999 - 12/20/1999

Salary: \$ 110,351 -- \$ 125,900

Contact: Dede Epstein
(301) 713-0530 106
dede.epstein@hrmo.noaa.gov

To obtain a vacancy announcement:
HR Central Services Division
Attn OFA4/NOAA#99-10 STA 12434
1305 East-West Highway
Silver Spring, MD 20910

Position announcement:
www.usajobs.opm.gov/wfjic/jobs/BN7945.HTM

Meteorologist

National Oceanic and Atmospheric Administration,
National Weather Service

Salary: \$ 64,332 -- \$ 83,632

Location: Miami, FL

Application Receipt Deadline: 12/10/99.

This person will be a hurricane specialist for 6 1/2 months out of the year, and will spend considerable time working with the emergency management community the remainder of the year.

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www.usajobs.opm.gov

National Weather Service
c/o U.S. Office of Personnel Mgmt.
601 E. 12th Street
Rm. 131
Kansas City, MO 64106

Position announcement:
www.usajobs.opm.gov/wfjic/jobs/CK0087.HTM

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