This is the first in a series of articles encouraged by the Board of Certified Consulting Meteorologists and the National Council of Industrial Meteorologists to explore the ethical issues that can be encountered conducting business in the meteorological community. The purpose is to initiate a discussion within the broader membership about how the professional guidelines section of the AMS constitution comes to life in the conduct of everyday life of professional meteorologists. Comments are welcome and should be addressed to the authors. More formal responses can also be made to the editor of BAMS.

BUSINESS ETHICS FOR PROFESSIONAL METEOROLOGY
Expectations and Satisfied Customers

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Many professional societies and boards have an ethics statement or code of conduct to which they expect their members to adhere. Our society has chosen not to have a separate ethics code, but has embedded clear guidelines for professional conduct into the organization’s constitution. These guidelines pertain to all of us as members, but are particularly meaningful to meteorologists in private practice, who strive to meet the expectations of a variety of customers.

THE PRIVATE METEOROLOGY SECTOR.
An article published in BAMS in 2007 estimated that private-sector meteorologists generally number about 4,000–5,000 persons, of whom about 1,600 were characterized as media meteorologists. The market value for the sector was estimated to be from $1.65 to $1.8 billion and possibly as much as $2 billion.

Private-sector meteorology involves traditional day-to-day work typical of most businesses, such as delivering products, billing, charging, and contract fulfillment. Some of these normal elements of conducting business are the very things that can become contentious between a company and their clients, leading to lawsuits and/or charges of unethical business practices.

AMERICAN BUSINESS ETHICS. In the United States, we can’t fail to be aware of the news about ethics and questionable corporate practices that have plagued the business community during the past several years. Although not particularly notable in the private meteorology sector, allegations of fraud and misrepresentation, mostly in the finance community, have caused the U.S. Congress to pass new legislation and regulations. An example is the Sarbanes-Oxley Act of 2002 (available at www.gpo.gov/fdsys/pkg/PLAW-107publ204/content-detail.html), which was passed in the wake of a multitude of corporate scandals. One of the outgrowths of Sarbanes-Oxley was a requirement that a code of ethics be adopted for senior financial officers.

All of this has raised consciousness about ethics in business. Certain state licensing boards and authorities have started to require people in professions that involve the public trust to take annual ethics training courses as a condition of license renewal. Universities have developed ethics courses in their business and engineering departments; students can now actually earn an academic degree in the subject. Meanwhile, many professional organizations have updated or revised their codes of conduct.

Most U.S. companies and governmental entities promote ethical behavior as a standard business practice. This is sensible from both a business and legal perspective. To survive, our organizations must retain the trust of customers over a wide range of issues, from correct project charging to the quality of our products and services. Like any other business, those of us working in private meteorology have an ethical responsibility to provide diligent and competent work for our customers.

CONDUCTING BUSINESS AS A METEOROLOGIST. Any arrangement for meteorological services, whether for a long-term business relationship or a single, short-term task, involves the expectation of three fundamentals: price, schedule, and performance to a standard. The service agreement...
may be a detailed contract or a loose accord, but those three elements are still the same. Beyond those expectations are several basic things about the business arrangement that anyone anticipates when they engage a contractor or consultant.

Many consulting arrangements for meteorologists are made on a time and materials basis. Receipts confirm the cost of materials and other expenses, but the customer is seldom in a position to verify when and for how long the meteorologist works on a project. A customer is entitled to an honest accounting of this time. Misrepresenting that work, or falsely claiming services have been performed, can violate the deceptive practices statute in a state Business and Commerce Code (e.g., California Business and Professional Code, Division 7, Part 2: Preservation and Regulation of Competition; and Part 4: Unfair Trade Practices, available at www.leginfo.ca.gov/html/bpc_table_of_contents.html).

The expectation of schedule means that a business agreement not only calls for the service provider to meet an established deadline, but also to communicate about impending delays or late deliveries. Failure to do so can lead to significant business opportunity loss for that client. There is an ethical responsibility to maintain a current schedule for any deliverable and to make an honest accounting for any schedule delays.

Not every employee in an organization has the skills to accomplish every job. Each of us has certain core capabilities, but we must sometimes recuse ourselves from tasks for which we lack training or experience. In the regulated professions, such as professional engineering, it is actually a violation of the law to accept work outside the range of one’s capabilities.

Clients expect that people we assign to their work will be competent in the relevant tasks. Meteorological consultants or contractors may be inclined to accept work with the belief that they can learn the necessary skills or substitute similar capabilities. Accepting work in an area outside one’s competence can lead to a failure to perform the work on time or perform work that reflects current scientific standards. Not only can this ruin a business relationship, but it can also be the basis for litigation over nonperformance of a contract.

**AVOIDING CONFLICTS OF INTEREST.**

Conflicts may arise between the competing private and professional interests of an individual or organization and their responsibilities to perform work for someone else. Potential conflicts of interest may be difficult to recognize and are easy to ignore. Simple conflicts may appear to be insignificant, but the mere appearance of a conflict can lead to accusations of unethical conduct. We need to avoid conflicts of commitment, conflicts over proper use of institution/company resources, use of one’s position, or conflicting relationships between company organizations.

Even when nothing improper happens, the appearance that a person can act for unmerited personal gain can cause doubt about the reliability of his or her performance. Any possibility of a conflict of interest must be examined closely before embarking on a business arrangement. The ramifications must be fully known by all parties. A third party can even be engaged to assess the situation prior to finalizing a business arrangement.

**CONFIDENTIALITY.** A company wise enough to recognize the influence of weather on their business will engage meteorologists to identify hidden business opportunities. This often involves the exchange of confidential business information. If confidential information is shared with, or even allowed to fall inadvertently into the hands of, competitors then the advantage of obtaining the meteorological services can be diluted or eliminated.

Some clients may require that a confidentiality agreement (such as a nondisclosure agreement, or NDA) be signed so that they have recourse if a breach of confidentiality occurs. In many cases, though, once the breach has occurred, no recourse can mitigate the business impact that may follow.

Confidentiality is disclosing information only to those who need to know, and protecting a client’s proprietary data from outright theft. The computer age has led to a rapid growth in the collection of all manner of commercial information, such as sales trends and consumer behavior. Companies go to great effort and expense to create such databases, but this intellectual property is easily transported or transferred if not protected properly.

Consider the case where a company that makes household insect pest control products believed there was a correlation between the timing of their product’s spring sales peak and the antecedent weather. They engaged a consulting meteorology firm to review their sales data for 10 major metropolitan markets in the United States and quantify a relationship if one could be found. Success would help them schedule advertising and product deliveries to stores so as to coincide with the year-to-year variations in the peak sales times. To facilitate the study,
the company provided the weather consultants with confidential multiyear sales data.

The consultants matched the historical sales data with concurrent weather data for the various locations and determined that there was a correlation with a particular degree-day function. (Appearance of pests in people’s homes was driven by temperature.) The consultants developed a system for the company so it could use extended temperature forecasts and outlooks as input to a model that predicted when the spring sales volume would peak.

After the contract was complete, the owner of the consulting company thought the study could generate an informative technical paper. Without discussing his notion with the client, he wrote and subsequently published a paper in a biometeorology journal describing the apparent relationship between temperature and the development of the insect populations that had been studied. None of the client’s sales data were tabled in the paper, and the precise prediction model was not given, but scatterplots showed the relationships. Was it ethical to publish the paper based on the client’s sales data and without their knowledge, even though the exact data were not divulged? Clearly, it would have been more appropriate to consult with the client about publishing a technical paper before submitting a manuscript.

**OTHER POTENTIAL PITFALLS.** The private practice of meteorology produces some unique possibilities for exceeding the boundaries or capabilities of our science. Typical areas for concern are

- making of extravagant claims (statements beyond established scientific fact that are represented as fact) to enhance the probability of acquiring or fulfilling a contract;
- overstating professional forecasting capabilities and skills;
- exaggerating weather modification skill to give clients a false sense of the probability of success;
- procuring contracts for goods and services through bribes (involving money, gifts, or services to a client);
- misrepresenting qualifications to properly provide services or render scientific opinions;
- making unfounded attacks on the abilities or practices of peers and competitors in order to harm their reputation or influence customers;
- accepting work beyond the scope or depth of one’s expertise;
- allowing attorneys or clients to influence or alter the scientifically supported results of investigations or opinions rendered;
- acquiring, storing, or using information about competitors that is obtained illegally or is confidential or a trade secret as defined by Restatement of Torts (1939) or the Uniform Trade Secrets Act.

**MEETING THE CUSTOMER’S EXPECTATIONS.** Whatever our customers expect of the services we provide, their satisfaction is essential if we want to retain a business relationship. Having a strong sense of professional behavior and ethical conduct with regard to both business practices and application of the science will help us meet our customer’s requirements and expectations, which is the definition of quality.

**FOR FURTHER READING**
