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## 1. INTRODUCTION

The Midwestern Regional Climate Center (MRCC) service program provides climate data and products to a wide variety of users in the public and private sectors. The service program consists of two components. Users may contact the MRCC directly by phone, fax, or email to request climate data. These requests are handled by two service climatologists. Users may also access climate data through the Midwestern Climate Information System (MICIS). MICIS is an interactive, web-based source that provides timely and easy-to-access climate information. It is a subscription-based service available to individuals, business, and public and private organizations and agencies. There are currently more than 400 registered users of MICIS. Both service components experienced considerable growth in the past ten years.

MICIS was developed in 1989 as a menu-driven text data delivery system. In 1993 a web version of MICIS was brought on-line and run concurrently with the text system. Users had the option of using either system. In early 2000 the web version was upgraded and the text version was discontinued. Detailed usage statistics have been kept on MICIS accesses since 1989 and service office requests since 1993, when the first full-time service climatologist was hired. Analysis of the trends demonstrated by these usage statistics reflect both changes in the demand for climate data and technological developments.

## 2. DATA COLLECTION AND ANALYSIS

A variety of usage statistics are collected and updated monthly. These include MRCC web site hits, MICIS data accesses, the number of data orders filled by the service office, the number of MICIS subscribers actively using the system and the data accesses for each, requests received by the service office, and requests broken down into a number of user categories. In addition, the MRCC service office tracks categories of data types ordered. Trends in both off-line (service office) and on-line data requests were examined.

## 3. GENERAL USAGE TRENDS

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Between 1990 and 1995 growth in the use of MICIS was fairly steady at a rate of about 30 percent per year. From 1996 through 2001 growth continued but was more erratic (Table 1), reaching a high of 86 percent in 2000. Part of this increase may be explained by the conversion to an entirely web-based interface and the use of a more sophisticated access accounting system. Increased accessibility to the Internet likely was an additional contributing factor.

Year	Percent change
1991	30
1992	25
1993	35
1994	22
1995	37
1996	55
1997	19
1998	-1
1999	38
2000	86
2001	32

Table 1. Annual growth in MICIS accesses

Contacts to the MRCC service office experienced a period of steady growth through 1998, but since have steadily declined (Figure 1). "Contacts" refer to all contacts with the service office, whether or not data is actually ordered. The rapid growth in the early to mid 1990s required the hiring of a second full-time service climatologist to help handle the volume of requests. Interestingly, the peak in 1998 corresponds to a leveling off of accesses to the on-line system, MICIS. The peak

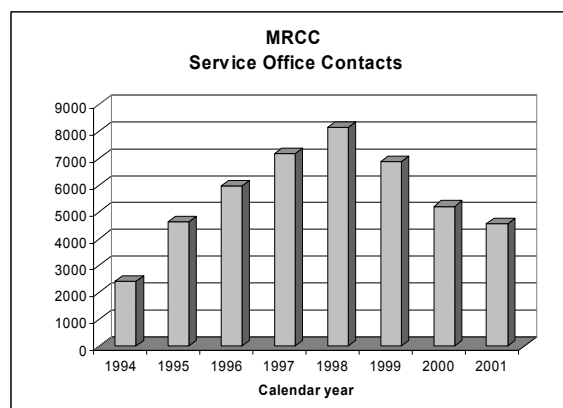


Figure 1. Annual MRCC service office contacts

number of contacts in 1997 and 1998 also occurred during the June 1997-May 1998 El Nino. During this time the MRCC produced three press releases and created a special El Nino web page to present the results of various analyses on the potential impacts of the El Nino on the Midwest (Changnon, 2000).

The decrease in contacts to the MRCC service office also corresponds to the increase in MICIS accesses and accesses to the MRCC home page. This would indicate that users of climate data are becoming more aware of the on-line availability of data and are more proficient in obtaining this data. Figure 2 shows the trend in off-line contacts with the trend in MRCC home page hits. A large number of contacts to the service office were sustained from the fall of 1997 through the following spring (El Nino). Spikes in monthly contacts tend to come one to three months after significant weather events. Many of these data requests come from the legal and insurance sectors. For example, the peak in March 1999 came two months after the Blizzard of 1999 in the Midwest. Many counties in the Midwestern states were declared disaster areas and required snowfall data to meet FEMA requirements for disaster assistance.

The increase in on-line vs. off-line access is also reflected in actual orders for data. Orders for data have been decreasing, while data accesses via MICIS have been increasing (Figure 3). MICIS accesses reached all-time maximums during the latter half of 2001. Many users that had been acquiring data on a regular basis through the service office were moved to on-line access.

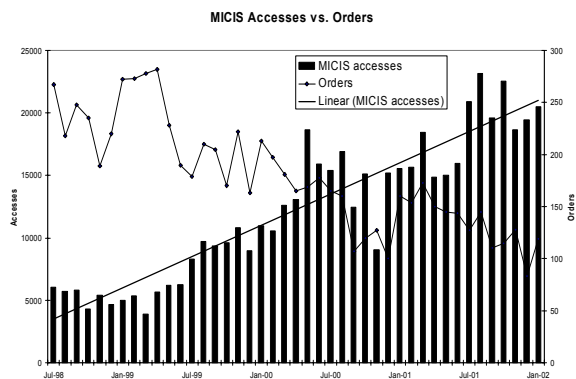


Figure 3. Climate data orders and MICIS accesses July 1998-January 2002

#### 4. PRODUCT RELATED STATISTICS

During the 2000 to 2001 period, statistics were maintained on the frequency of orders by product category (Figure 4). Requests for daily data were the most dominant. Daily data refers to climate data produced in a daily time series format. Much of this data originates from the National Weather Service

Cooperative Observer Network, but it also includes daily averages of hourly data and daily data from other networks.

Requests for subscriptions and special services were also significant. Most of the requests for this category were related to starting and maintaining MICIS subscriptions. Other subscriptions, such as paper or FTP subscriptions, were also included in this category. Requests for special data or data in non-standard formats were included in this category as well.

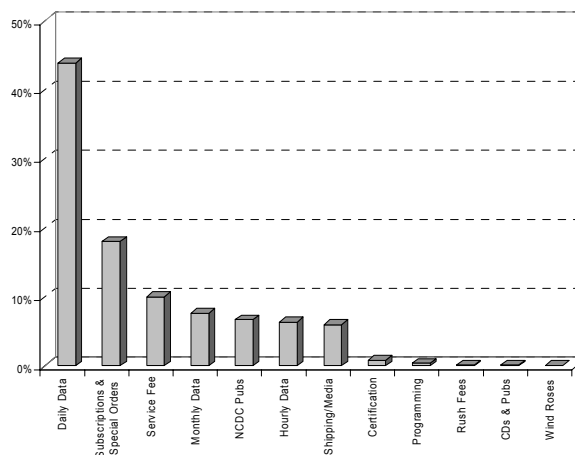


Figure 4: Percent of total requests for selected MRCC products and services

#### 5. SECTOR SPECIFIC STATISTICS

Clients requesting climate data services from the MRCC were classified into 18 categories during the 2000-2001 period (Table 2). These categories represented the sector that best described the client's organization. Clients not affiliated with an organization were classified as individuals. Some organizations were more difficult to classify than others. For example, the consultant category included organizations from a

Agriculture	Legal
Consultant	Manufacturing
Consultant Meteorologist	Media
Contractor	Medical
Education	Recreation
Engineer	Research
Government	Retail
Individual	Transportation
Insurance	Utilities

Table 2. MRCC customer classifications

variety of fields that could not be classified into other sectors. The utilities sector included traditional utilities, such as electricity providers, but also more non-traditional groups such as weather derivatives companies. Finally, research and education were

similar. For the most part, the research sector included organizations not affiliated with schools and universities.

Orders generated from each sector were tracked during the 2000 to 2001 season (Figure 5). This indicated that the legal sector made the most requests for climate data services in terms of total orders. Other strong sectors included the insurance, consultant and individual sectors. Other notable categories were the agriculture and utilities sectors. Legal and insurance requests comprised more than 40% of total orders. These categories have been consistently the highest percentage of orders year to year. This is similar to results found in a 1997 survey of MRCC users (Crech, 2000).

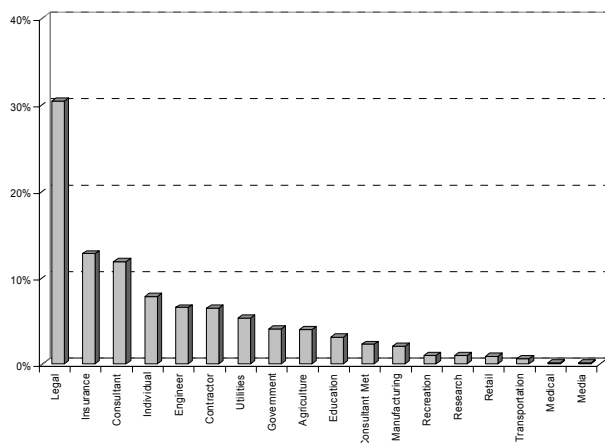


Figure 5: Percent of total orders by sector

## 6. COMPARING SECTOR USAGE OF MRCC PRODUCTS AND SERVICES

Selected products and services were analyzed to determine which sectors were requesting MRCC services (Figure 6). Legal, insurance and individual categories were combined due to similar ordering patterns. A large percentage of the NCDC publications requested from the MRCC originated from these sectors. Requests from these sectors also resulted in a significant percentage of daily data and hourly data orders. These products are preferred by the legal, insurance and individual sectors because they are generally easy to understand and interpret. Also, since orders from these sectors tended to be climate event-driven, summary information such as NCDC's Local Climatological Data was also favored. One other interesting service to note is certification. The number of requests for certified climate data was relatively small. However, certified data is often required by these sectors for use in legal proceedings. Nearly all certification requests came from these three sectors during the 2000 to 2001 period.

The agriculture and utilities sectors tended to request larger data sets and special services from the MRCC. This is evident by examining request patterns

for daily data, which is the most frequently ordered MRCC product. During 2000 to 2001, over 60% of all daily data requests came from the agriculture and utilities sectors. Interestingly, less than 10% of all orders originate from these sectors. This indicates that these sectors were making infrequent but fairly large requests for climate data services. These sectors also produced a significant percentage of requests for subscription services, special products, programming services and hourly data.

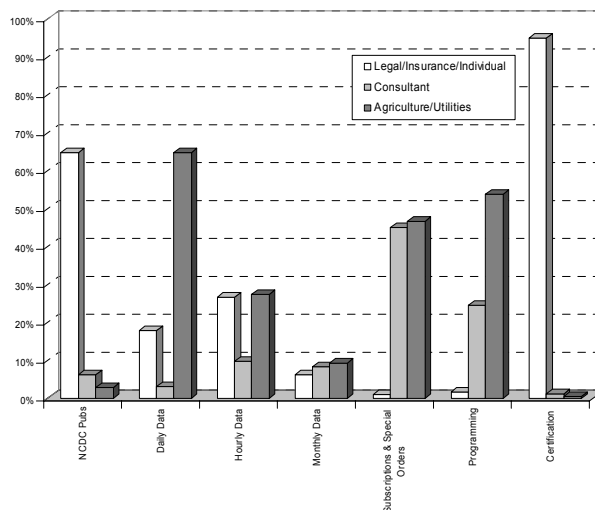


Figure 6: Percent of requests for selected MRCC products by selected sectors.

Subscription and programming services were also popular among the consultant category. This reflects a need for recurring climate data for this sector. Percentages of subscription and special services requests were nearly the same for this sector as the agriculture and utilities sectors.

## 7. UNDERSTANDING THE TRENDS

Analysis of usage and sector trends during the 2000 – 2001 period has given the MRCC a better understanding of who requests climate data, how climate data is used and where resources should be allocated to meet the requests for data. The goal in assembling these figures is to improve climate data services to these sectors.

Since 1998 there has been increasing usage of on-line services and decreasing usage of "off-line" services at the MRCC. The increasing use of on-line services reflects an increasing use of the Internet in general and an increased awareness of users of the availability of on-line data. Despite a general decrease in off-line requests for the last few years, the number of requests has shown some evidence of leveling off. There will likely always be a need for this kind of service. Legal and insurance users, who usually request very specific information, often need additional services such as certification. The other category of user for which off-line services will always be needed includes those who

are not sure or do not know what climate data they need to answer their question. These questions can usually be resolved by consultation with a climatologist.

The legal sector remains the largest user of climate data services in terms of total orders. This sector and the related insurance and individual sectors tend to order climate data for specific weather and climate events. Concentration should be placed on collecting and providing data as significant weather events occur. These sectors also tend to be more non-technical than other sectors. To increase the usefulness of climate data, careful attention should be made to provide summaries that are easy to understand and interpret.

Agriculture, utilities and consultant sectors need special attention as well. These sectors make the heaviest use of special services, such as subscriptions and programming. With overall increases in Internet traffic, it makes sense to focus on providing additional climate data and products online. Improving the timeliness and accuracy of near real-time climate data will also benefit these sectors. Subscription services can also be improved by increasing the amount of data available through our online services. This will help satisfy the bulk data requirements for these sectors. It may also be useful to concentrate on providing additional value-added services, such as improved crop models and analyzed climate data.

## **8. ACKNOWLEDGEMENTS**

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