Survey Results of Society Membership: The Face of Our Profession at the Threshold of the New Millennium

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ABSTRACT

In the spring of 1999, the American Meteorological Society surveyed its membership in order to update demographic information on the Society and to gain a more detailed perspective on the workplace. The survey was sent out with the dues statement and was solicited on a separate form returned independently to protect privacy and maintain anonymity. The responses were captured in a newly employed, machine-readable format to provide an ease of statistical analysis and data compilation not available in prior survey analysis. This data collection and subsequent demographic analysis represents the first attempt to update information regarding the membership since the 1993 survey results were published by Zevin and Seitter. The format of the 1999 survey was designed to logically follow and expand upon the historical data of the membership collected at varying intervals since 1975.

The 1999 survey was broken into six parts. The sections on demographics, education, and current employment closely followed the previous surveys from 1993 and 1990 to facilitate direct comparisons between historical datasets whenever possible. The last three sections were reworked to elicit more declarative responses regarding personal circumstances, workplace circumstances, and additional issues concerning career choice and AMS membership, respectively. An additional space was provided for narrative comments regarding opportunities for women and minorities in the AMS-related sciences. Some 10 000 members were sent the 1999 dues statement and enclosed survey questionnaire. A total of 4669 members responded. The following is a detailed analysis of the data collected from the 1999 membership survey.

1. Introduction

a. The twentieth century: AMS membership history

When the American Meteorological Society (AMS) was founded back in 1919 by Charles Franklin Brooks of the Blue Hill Observatory, the initial membership numbered less than 600. Meteorologists from the U.S. Signal Corps, the U.S. Weather Bureau, and a smattering of weather hobbyists populated this small group (AMS 1960). Although the mission of the Society, to serve as a scientific and professional organization committed to the atmospheric and related sciences, has remained unchanged over time, the shifting characteristics of the membership over the last several decades has required a new appreciation for who we are today.

b. AMS membership survey: Last 25 years

For the fourth time in the last 25 years, the AMS surveyed its membership in 1999 to update its demographic information and to foster a deeper understanding of the current professional/work environment. The subsequent analysis of the survey results is part of a continuing effort to define the face of our profession in hopes of better serving relevant sectors of the scientific community through Societal initiatives and objectives. The Society also hopes to provide leadership in addressing critical atmospheric and environmental issues that may arise in the twenty-first century by capitalizing on a better understanding of the challenges and culture of professional/work life.

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The 1999 survey represents a continuum of demographic membership data begun as a loosely organized longitudinal study back in 1975 and logically reflects upon the chain of information begun by Kellogg (1977) and Stephens and Kazarosian (1992). In 1993, the survey was expanded to include questions about the professional/work environment in hopes of providing insight on practices in the workplace and their influence on an increasingly diverse workforce. In 1994, Zevin and Seitter (1994) continued the chain of historical information with a detailed analysis of the 1993 survey results.

c. AMS survey: Year 1999

The format of the 1999 survey was designed to logically follow and expand upon the historical data of the membership collected to date. The survey was organized into six parts (see the appendix). Questions focusing on demographics, education, and employment status closely followed the 1993 and 1990 surveys to aide in direct comparison between the datasets. The subsequent sections on personal and workplace circumstances were reformatted to elicit more declarative results when compared with the 1993 survey. The first of these two sections focused on questions pertaining to the impact of marital status, race/ethnicity, gender, sexual orientation, disability, and dependents, when applicable, on the respondent's professional career development. Other questions pertained to the respondent's impressions on the career advancement of traditionally underrepresented groups in the AMS. An investigation of workplace practices and issues surrounding diversity in the workplace completed the last of these two sections. The final part of the survey focused on "additional issues" and provided a structured evaluation of the respondent's selection of an AMS-related career and assessment of AMS membership, while allowing for open discussion on the status of women and minorities in the AMS community.

This paper begins with a demographic overview of the 1999 survey data. Further discussion focuses on issues relating to education, employment, salary, and diversity. Subsequent analysis explores more specific topics including personal circumstances in relation to workplace issues, workplace practices, and the current status of women and minorities. A review of comments from respondents on the role of the Board on Women and Minorities (BWM) and responses regarding opportunities for women and minorities in AMS-related sciences will also be presented.

It should be noted that only responses clearly marked on the survey were incorporated into the final analysis. The *t* test was used with the null hypothesis that the means of the two samples (1993 and 1999 datasets) were equal to determine the statistical significance for various sample runs. Results that are considered to be statistically insignificant due to the relatively small size of the dataset are noted throughout the text. In some instances, multiple selections were an option in the survey data collected. The manipulation of these datasets is handled in various ways depending upon the premise of the question. The hope is to elicit the most useful or insightful result.

2. Survey distribution and response

This voluntary survey was distributed to the membership in conjunction with the 1999 dues statement. Similar to the 1993 survey, the 1999 questionnaire was enclosed as a separate form from the dues statement to be returned anonymously. More than 10 000 members received the 1999 statement in the fall of 1998. By the spring of 1999, a total of 4669 members had responded, representing the lowest return rate this decade. It should be noted, however, that this return rate is still considered outstanding when compared with most surveys. The diminished returns may have been the result of concern over computer tracking codes appearing on the bottom of the survey sheets. These numbers were not meant to connect the data with the individual respondent, but were used only to manage the large volume of responses sent to an offsite data collection company. Others may have opted not to reply to the survey based simply on the nature of the questions. Although responses to the 1999 survey represent a slightly smaller cross section of members than previous survey data, a response rate approaching 50% still represents a statistically representative sample according to most experts (Edwards 1997).

3. Survey results

a. AMS membership: Of interest

Before we explore the results of the survey data, a few points of interest regarding the general membership are noteworthy. Of those AMS members that responded to the survey, almost 39% have been members for over 20 years, while some 26% fall into the 11–20-year time frame. Newer members affiliated

with the AMS for less than five years total 20%. Of those respondents that have been members for less than two years, the majority (49%) cite financial concerns as the reason for not deciding to become members of the AMS before. Only 11% cited a negative view of the AMS as a reason for not joining earlier, while 13% indicated that they had just entered the field. Respondents felt that the primary benefits of being an AMS member included staying informed (28.3%), the *Bulletin of the AMS* (18.3%), and receiving other publications/journals (16.4%).

It is interesting to note that the primary factor that influenced AMS members to pursue a career in an AMS-related field was curiosity (77%). A much smaller number (roughly 6% in each case) were inspired by either an experience or by a teacher. Of those responding to this question, just over one-quarter experienced the influencing factor while an undergraduate (28%). A large number of respondents (25%) were influenced while in elementary school while 15% were impacted in high school and another 15% were influenced in graduate school. A smaller number of respondents (11%) were inspired to choose an AMS-related career in junior high or as a postgraduate (5%). Of note, the majority of female respondents (34%) cited their undergraduate years as the most influential period, while the percentages for males was more evenly split between the two academic stages—elementary school (26%) and undergrad (27%). Of those respondents indicating high school as their most influential period (15%), the majority cited curiosity as the driving force (78%), while a smaller number indicated that a teacher or an experience inspired them (both 5%, respectively).

b. Demographics: A general overview

When placed in direct comparison with the survey results from 1993, the demographic data collected in 1999 reflect a solid cross section of the membership and a fairly uniform continuum of information. As would be expected, the time gap between surveys does bear witness to some changes in the overall composition of the membership. The age distribution of the respondents in 1999 reflects a membership weighted to the older age bins (Fig. 1). In 1993, the greatest number of members fell into the 30–39 age category. In 1999, the spike in membership occurred in the 40–49 age group. Taken collectively, only 33% of the AMS membership were younger than 40 years old in 1999, while 40% of the respondents were older than 50, with 9% of those reporting an age of 70 and over. The differences in age between datasets were not statistically significant at the 95% level.

Ninety-two percent of the respondents were U.S. citizens. Just over 3% were on temporary or permanent visas and almost 5% were non-U.S. citizens. The mid-Atlantic area, representing the largest population of respondents in 1993 (17%), was given a separate residence category from the "capital area" in the most recent survey, dropping the number of respondents to a mere 8%. When combined with the total respondents from the capital area, the percentage again rises to 21% (Table 1). This supports the conclusion of Zevin and Seitter (1994) that the majority of respondents from that region do indeed work inside the Beltway.

Although the largest percentage of AMS members is living in the United States, 421 members responded from residences abroad in 1999, which represents a slight decline since 1993 (440). The largest dropoff in the number of respondents since 1993 came from those residing in Canada.

The 1999 survey continues our look at certain societal characteristics of our membership. According to the most recent data, the majority of respondents (75%) were married, up 2% from 1993. The number of single members went down to roughly 18% from 21% in 1993. Those considering themselves to be partnered/unmarried totaled just less than 2% of the respondents. Those widowed, divorced, or separated composed just over 5% of the responses. The impact of marital status, along with other demographic spe-

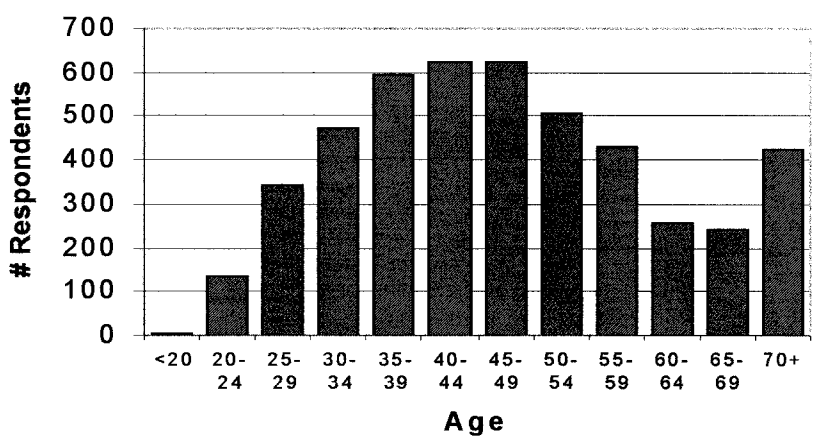


FIG. 1. Age distribution of respondents to 1999 survey.

TABLE 1. Geographic distribution of survey responses.

Region	No.	%
United States		
North-central	743	15.9%
Pacific	639	13.7%
Capital area	596	12.8%
Mountain	527	11.3%
South Atlantic	491	10.5%
South-central	484	10.4%
Mid-Atlantic	390	8.4%
New England	365	7.8%
Europe	161	3.4%
Asia	86	1.8%
Canada	71	1.5%
Australia/Pacific Islands	52	1.1%
South America	17	0.4%
Puerto Rico	9	0.2%
Mexico/Central America	8	0.2%
American Samoa, etc.	7	0.1%
Carribean Islander	5	0.1%
Africa	4	0.1%
Antarctica	1	0.0%

cifics, on personal and workplace circumstances will be explored later on in this paper.

c. Diversity: A look at gender, race/ethnicity, and persons with disabilities

Although the status of women, minorities, and persons with disabilities in AMS-related fields will be discussed in greater detail in the following pages, an initial review of the 1999 survey results does indicate a slow but steady increase in the number of women in the field. In 1999, almost 11% of the membership was

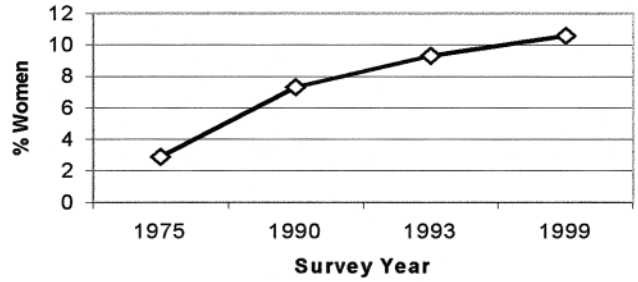


FIG. 2. Percentage of women respondents by survey year.

female, compared to 9.3% in 1993 (Fig. 2). Based on the *t* test, the data on gender given the two samples are statistically significantly different at the 99% level. According to a study done by the National Science Foundation (NSF) in 1998, women constituted 51% of the U.S. population in 1995 and 46% of the labor force (NSF 1999). The labor force was defined as civilians 20 years of age or older who are actively seeking employment or are already employed. In 1995, women composed 22.4% of the science and engineering workforce (NSF 1999). Of the specific fields cited, more than half of psychologists were women, 47% of sociologists were female, as were 12% of physicists, and 9% of engineers (NSF 1999).

Growth in minority populations among AMS members has remained miniscule over the last 25 years. Of the respondents, 90.6% (4162) were white, down from 92.4% in 1993 (Table 2). Just over 91% of the men that responded were white while 88.7% of the women responding were white. African-American/black members closed in on a full 1% (42), which represents a slight rise since 1993 and the most significant gain since the first survey in 1975. Still, the smallness of this population indicates that the increase is not statistically significant. Native American/Eskimo/Aleut (28) represented little more than half a percentage point, while Hispanics (71) composed 1.5% of the respondents in 1999, indicating a very slight increase over the 1993 survey. The Asian/Pacific Islander population displayed the greatest increase, rising from 4.5% in 1993 to 5.2% in 1999.

This result may represent the increase in AMS members living in Asia as revealed by the results of the geographical distribution of survey respondents. Of the 5.2% Asian/Pacific Islanders, 85.5% were men and 14.5% were women. The differences between the 1993 and 1999 datasets are very small, but the likelihood that those differences are due to chance is also very small. According to the *t* test employed, the two samples are statistically significantly different at the 99% level.

Based on a report completed in 1998 by NSF on women, minorities, and persons with disabilities, the recent information on the minority population in the AMS indicates that numbers remain close to or below the percentages of underrepresented groups working in science and engineering back in 1995 (NSF 1999). Blacks, Hispanics, and American Indians represented 6% of the science and engineering workforce that year, according to NSF, and composed 23% of the U.S. population. Broken down, blacks were 3.4% of the labor force, Hispanics 2.8%, and American Indians less than 0.2% (NSF 1999). Asians represented 9.7% of the science and engineering workforce in 1995 and only 3% of the U.S. population while 83.8% of scientists and engineers were white (NSF 1999).

TABLE 2. Distribution of responses (%) by ethnic background in survey year.

	1975	1990	1993	1999
African-American/Black	0.5	0.6	0.7	1.0
Native American/Eskimo/Aleut	0.9	0.8	0.3	0.6
Hispanic	0.4	1.2	1.4	1.5
Asian/Pacific Islander	3.2	4.1	4.5	5.2
White	94.0	93.3	92.4	90.6
Other	1.8	–	0.6	1.0

It should be noted that this was the first survey to allow for multiple selections under race/ethnicity to make provisions for mixed-race responses (see Table 3 for a more complete categorization). In cases of a mixed-race response, the member was tallied under their minority selection.

Forty-five respondents selected "other" when asked what race/ethnicity they represented. Of these responses, many indicated a biracial or biethnic ancestry. Some confusion seemed to exist in classifying oneself as "European," while others chose to simplify matters by indicating they were representative of the "human race."

The 1999 survey showed a slight decrease in the number of members indicating some type of disability, with 3.3% responding in the affirmative compared with 3.6% in 1993. The small number of responses to this question negates any direct comparison of this slight deviation. The physical impairments listed by respondents represented a similar breakdown as those indicated back in 1993. Although estimations on the general population with disabilities varied widely, the 1998 NSF report estimated that roughly 20% of the population suffered from some type of disability, with 10% reporting more severe cases (NSF 1999).

The degree to which gender, race, or physical challenges have impacted a respondent's personal or workplace circumstances will be discussed in subsequent parts of this paper.

d. Education: Degree and field of major

Excluding those respondents currently pursuing their first bachelor's degree, 1.23% of the members that responded hold a high school degree as their high-

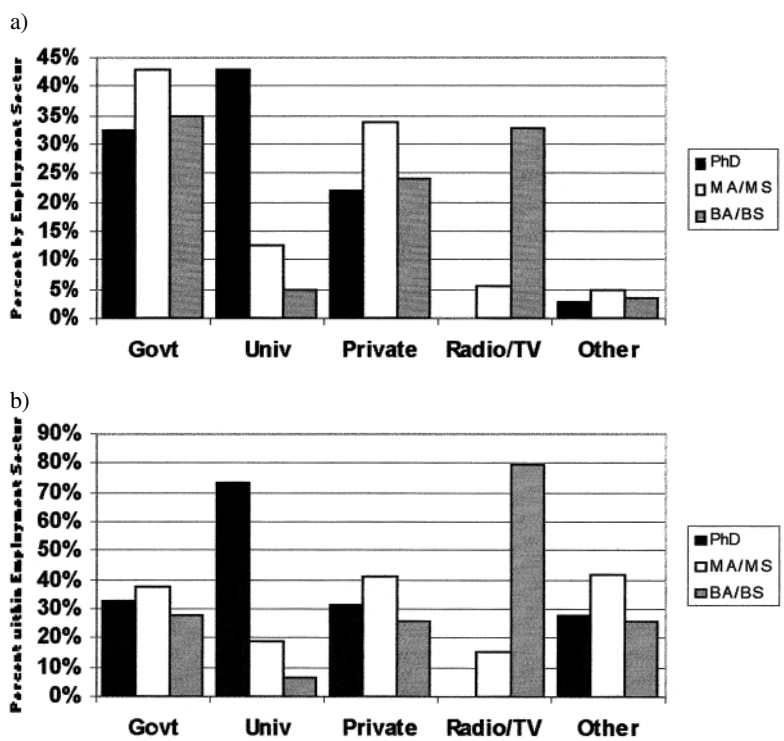


FIG. 3. Distribution of highest degree obtained by survey respondents (a) across noted employment sectors and (b) within employment sector.

TABLE 3. Distribution of respondents by age, sex, and ethnic background. Note that only those respondents who answered all three questions were included in this distribution, so the final total is less than the total number of responses to each individual question. For each entry in the table, the first number represents the number of male respondents, and the second the number of female respondents. The total entries combine male and female responses.

Age	< 20	20–29	30–39	40–49	50–59	60–69	70+	Total
Asian		5/6	50/18	65/4	37/4	26/1	11/0	194/33
Asian/White		0/1	2/0		1/0	1/0		4/1
Black		2/2	9/3	10/2	3/0	4/0		28/7
Black/Hispanic/White			0/1					0/1
Black/Nat. Am./White							1/0	1/0
Black/White			2/0	2/0	1/0			5/0
Hispanic		1/3	12/0	20/1	11/0	2/1	4/0	50/5
Hispanic/Asian					1/0			1/0
Hispanic/Asian/White				1/0				1/0
Hispanic/White		2/0	3/1	1/0	1/1	2/0		9/2
Nat. Am./White		3/0	3/1	6/1	2/0	1/0	3/0	18/2
Native American		1/0	0/1		3/0			4/1
Other		2/1	6/0	12/1	8/1	3/0	4/0	35/3
Other/White		1/0	4/0	2/0	2/0			9/0
White	4/0	346/98	778/157	964/123	782/34	426/10	382/10	3682/432
Total	4/0	363/111	869/182	1083/132	852/40	465/12	405/10	4087/442

est degree while an additional 0.9% indicated an associate's degree to be their highest degree obtained. As shown in Table 4, these percentages have consistently dropped since 1975 with the majority of the respondents indicating completion of a bachelor's degree (96.3%). According to the 1999 survey results, 28% indicated that this was the highest degree they obtained, while 32.5% went on to get a master's, and 35.8% continued on to complete a doctorate. For the first time since 1975, the option to indicate a second B.S./B.A., master's, or doctorate degree was not included in the survey. This information had not been used in previous survey analysis and was thus omitted to streamline data collection.

Of interest to the general membership is the distribution of the highest degree obtained given the category of employer (Fig. 3a) and within each employment category (Fig. 3b). For example, employees of the government hold almost 43% (538) of M.A./M.S. degrees. Of those employed in the government sector, 38% indicate that this is the highest degree that they have obtained. Of those respondents holding a doctorate, 43% (626) are held by those employed in the university sector. Of those employed in higher education, an overwhelming percentage (73%) reported a Ph.D. as their highest degree obtained. The majority of members employed within the private sector hold a master's (41% or 427 respondents) or doctorate (31% or 322).

TABLE 4. Distribution of responses by degree obtained from the AMS surveys conducted in 1975, 1990, 1993, and in 1999. The option to indicate a second degree was omitted in the most recent survey; thus, responses are noted as not applicable.

	1975	1990	1993	1999
Precollege (H.S./associates)	10.2	n/a	3.4	2.1
B.A./B.S.	89.9	86.0	96.5	96.3
Second B.A./B.S.	n/a	6.0	10.6	n/a
M.A./M.S.	65.7	57.0	68.0	68.3
Second M.A./M.S.	n/a	4.0	5.2	n/a
Ph.D.	28.2	30.0	32.8	35.8
Second Ph.D.	n/a	< 1.0	< 1.0	n/a

These degrees represent 34% and 22%, respectively, of the highest degrees obtained across all employment sectors.

The single largest percentage of B.S./B.A. degrees (35%) is held by those employed by the government, while members working in radio/TV amount to 33% reporting this degree as their highest degree obtained. Only 28% of those employed within the government sector reported a B.S./B.A. degree as their highest degree obtained, while an overwhelming majority of employees within the radio/TV category (79%) reported a bachelor's degree as their highest degree conferred.

These percentages are very similar to the totals presented in the demographic analysis completed in 1993. It should be noted that these data are based on the inclusion of both full-time and part-time employees. The choice not to break down the data further is based upon conclusions drawn by Zevin and Seitter (1994). In their attempt to create a separate analysis for those strictly employed full-time, it was found that the dataset varied little from the tallies accounting for both groups.

As one might expect, the majority of respondents indicated their field of major to be atmospheric science/meteorology for all degrees conferred. Of those holding a B.S./B.A. degree, 50.2% indicated this major, while 62.8% of those holding a master's degree, and 56.8% of Ph.D.s had done their higher degree in this subject. Physics, mathematics, and engineering, in descending order, continue to be the most common choice of undergraduate major for those not obtaining a degree in atmospheric science/meteorology. Other popular majors for those indicating a master's degree include physics, engineering, oceanography,

TABLE 5. Principal employer of respondents.

Principal employer	Count	%
Aviation industry	42	1.1
Contracting/systems firm	177	4.5
Federal government civilian	1018	25.7
Federal government military	145	3.7
Government-sponsored lab	151	3.8
Instrument manufacturer	25	0.6
International organization	21	0.5
Municipal/local government	10	0.3
Nonprofit organization/institution	78	2.0
Other	79	2.0
Other business—private	121	3.1
Other educational institution	10	0.3
Other research institution	56	1.4
Precollege educational institution	36	0.9
Private consulting firm	250	6.3
Private data and forecasting	95	2.4
Radio/TV station	477	12.0
Self-employed	150	3.8
State/county government	123	3.1
University/college	859	21.7
Utility industry	39	1.0
Total	3962	100.0

and geography, again in order of frequency. Of note, 80 respondents or 2.8% received an MBA. Oceanography, physics, and engineering are the three most popular subjects for Ph.D.s, in descending order, after atmospheric science/meteorology.

e. Employment: Status, employer, and position

Based upon the survey results from 1999, almost 82% of respondents were employed full time, while 8.2% considered themselves part-time employees. The unemployment rate among members that returned the survey totaled roughly 6.6%. Of those electing to indicate an additional status, 25% were graduate students, 6% undergraduates, and 69% respondents were retired, again reflecting the stratification of a Society with a large percentage of more senior members (39% of the respondents have been members of the Society for over 20 years).

Again in 1999, the government employed the largest number of respondents according to the survey data (see Table 5). Of those government employees, 25.7% were civilians, the majority likely representing employees of the National Weather Service. When other government workers from military personnel to state, county, and municipal government, to those in government labs, were all grouped together, the total government employment percentage totaled 36.5%, which is comparable to the 35.5% reported by Zevin and Seitter (1994). These numbers are of interest given the recent modernization efforts of the National Weather Service that have been marked by automation, restructuring and downsizing, and conservative hiring practices (Smith and Snow 1997).

The next largest employer, which is consistent with 1993 figures, was the academic sector (universities/colleges). Of the respondents, 21.7% worked in this setting. Based on the information presented by Zevin and Seitter (1994), the radio/TV industry has grown since 1993 (12%), to assume a strong foothold as a subset of the private sector (11.8%) with its own unique set of circumstances. Smith and Snow (1997) anticipated the growth in the broadcast sector. They noted that a large percentage of the 2000 available positions in the sector had in the past been filled by nondegreed weathercasters. A large number of respondents to the question of primary employer (670) left this question blank.

Of those indicating a secondary employer, the university/college sector employed the largest number of people (168) in this capacity. Those self-employed (110) represented the next largest crop, while 72 respondents indicated that a secondary income came from work in the radio/TV sector.

Based on the 1999 data, almost 76% of respondents considered themselves to be in middle or senior levels in their place of work. This result is a sharp increase from the 60% that considered themselves to be at that level in 1993 based on the findings of Zevin and Seitter (1994). Furthermore, 11.7% considered themselves to be executives, leaving only 12.5% of those surveyed in an entry-level position. Twenty-five percent of the respondents indicated that they had been employed in an AMS-related science for 20–29 years. Almost 57% of those surveyed have 15 or more years of experience, while those with less than 10 years experience totaled 28%. It is highly likely that these numbers are not representative of the profession as a whole, but reflect the small percentages of young professionals seeking membership in the AMS. The percentage of respondents in various categories indicating that they have supervisory responsibilities is provided in Table 6.

TABLE 6. Percentage of respondents by category who report having supervisory responsibilities. Responses are broken down by gender, race/ethnicity, and disability. It should be noted that a definition outlining criteria for "supervisory responsibility" was not provided in the survey.

	Supervisory (%)	Nonsupervisory (%)
Male	60	40
Female	47	53
White	58	42
Native American	46	54
Asian	56	44
Black	50	50
Hispanic	71	29
Disabled	54	46

f. Salaries

Of the survey data collected by AMS over the last 25 years, information concerning salary stratification by age, gender, race/ethnicity, employment sector and status, and years of experience has proven to be the most interesting and often most useful to the member-

ship. The 1999 survey was fashioned after the detailed questionnaire posed to the membership in 1993 to allow for a rich comparison. Based on a general overview of the results, the greatest number of respondents (24%) fell into the $60,000–$80,000 range (Fig. 4). Of those falling into this salary mode, only 87 were female. It should be noted that these data do not differentiate between full- and part-time employment nor do they differentiate between 9-month and 12-month academic appointments.

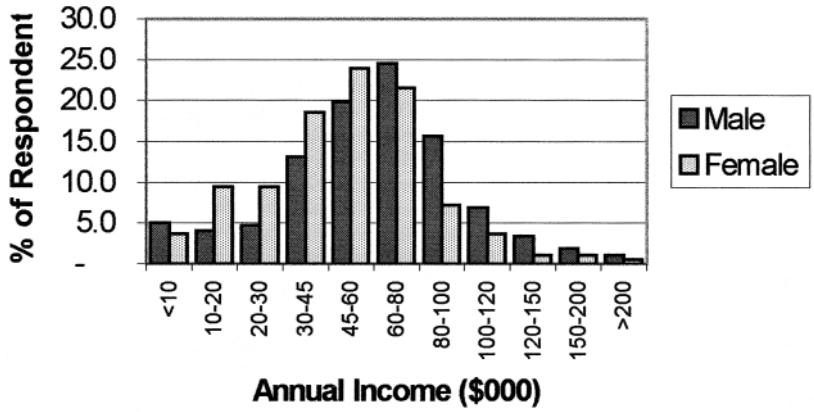


FIG. 4. Distribution of male and female respondents by annual income.

Figure 5 represents the distribution of annual income by employment sector. Each employment category includes a broad range of salaries with modes mainly falling between $45,000 and $80,000. Comparing these figures to the salary data reported in 1994 by Zevin and Seitter, the rough annual income of the most often reported mode has increased by some $15,000–$20,000. Of note, salaries in the government sector largely fell into the $40,000–$60,000 mode in 1993 (Zevin and Seitter 1994), while in 1999, the main salary mode for government employees now lies between $60,000 and $80,000. Salaries in the growing private sector seem to be keeping pace with the six-figure salaries once largely relegated to those employed in the radio/TV industry. The largest percentage of those respondents paid $30,000–$45,000 were represented by the radio/TV industry. This same sector is the only sector that registered more than a percentage point of salaries over $200,000.

When comparing men and women in terms of salary as both a function of age and years of experience (Figs. 6 and 7, respectively), the data presented are strictly based on those respondents indicating full-time employment. No differentiation was made between 9-month appointments and 12-month appointments given the data from the university community. As noted by Zevin and Seitter (1994), because a significantly higher fraction of women are employed part time, the inclusion of those employed on a part-time basis unfairly biases female salaries toward lower values.

An overview of incomes sorted by age for men and women employed full time (Fig. 6) indicates a narrowing of the salary disparities that existed when the previous survey was completed in 1993. Similar to the past, males and females in the youngest age category, 20–29, are paid comparably. According to the latest survey, the slight gap that existed in the 30–39 age range has been closed, and the disparity in pay between males and females of 40–49 years of age has narrowed from roughly $10,000 in 1993 to $5,000 in 1999. The pay gap between men and women seems to have increased slightly in the 50–59 age group, however, since the last survey was conducted.

When comparing pay, the stratification of data based on years of experience (Fig. 7) highlights equally promising trends when compared with the survey results from 1993. According to the 1999 dataset, only subtle variations in salary exist between men and women with 0–14 years of experience. The greatest disparity exists between entry-level salaries (zero

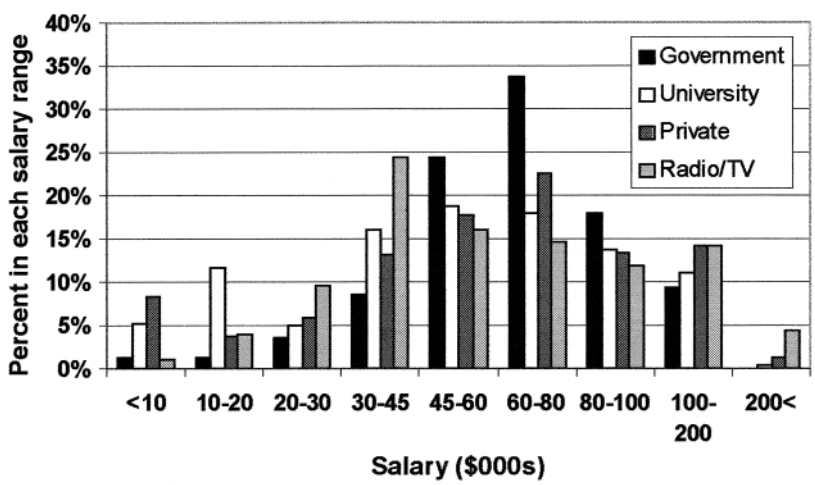


FIG. 5. Distribution of annual income within employment sector.

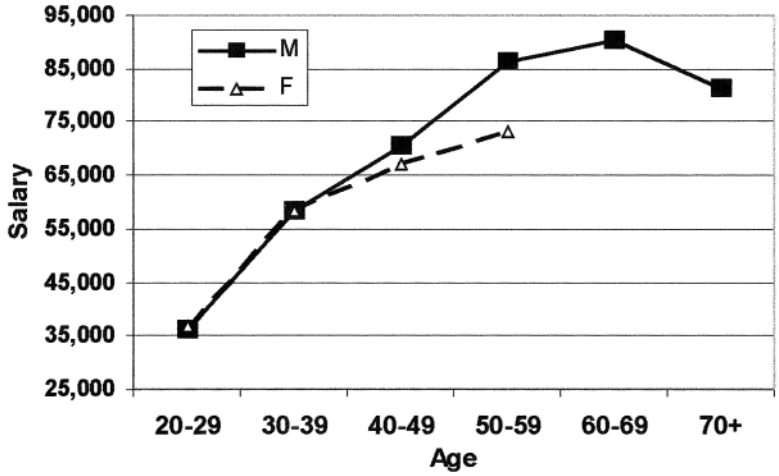


FIG. 6. Average annual salary as a function of age for both men and women. This plot includes salary data collected only for those reporting full-time employment. Both 9-month and 12-month academic appointments were considered full time. See text for reason behind selection of this dataset. When there were less than five respondents in a category, the data were omitted.

to two years' experience) where men are paid roughly $3,000 more than females. Females earn roughly $1,000 more than males given 3–9 years' experience, with only a slight gap of less than $1,000 between males and females reporting 10–14 years of experience. At 15–19 years of experience, females are actually paid an average salary of $79,950, or almost $8,000 more than their male counterparts. For those respondents reporting 20–29 years of experience, females earned less than males by just over $11,000, which appears to represent a slightly smaller gap in the salary disparity than existed back in 1993.

In order to fairly compare male and female salaries, beyond this cursory review, Table 7 presents a more detailed breakdown of salaries within employment sector for years of experience. The government sector appears to be the only sector that hires female entry-level employees at a slightly higher salary than males. In the radio/TV sector, females are paid more than their male counterparts in every experience category except for entry level (zero to two years). Females in the private sector are paid higher than males only in the 3–5-year experience category while the average salary for females in the university sector only exceeds males in the 10–14-year experience range.

The salary bump for females in the 15–19-year experience category appears to come largely from the salary gap between males and females in the radio/TV sector at that experience level and, to a lesser degree, the slightly higher salaries paid to women in the government sector given those years of experience.

g. Women's trends: Status of women in the profession/society

The 1999 survey results reflect a growing presence of a youthful female population in the Society. Of those who identified their gender on the survey, 89.4% (4120 respondents) identified themselves as male and 10.6% (489 respondents) identified themselves as female. This suggests a slowing of the increase in the presence of women in the Society (women composed 2.4% according to the 1975 survey, 7.3% in 1990, and 9.3% in 1993; Fig. 2). However, the age distribution shows (Fig. 8) that women make up a larger portion of Society membership with decreasing age. This suggests that the increase in the presence of women will continue as the sample ages if the current female population in the AMS maintains their status as members of the Society. The median age of women in the dataset was roughly 37 years, whereas the median age of men was close to 47 years. The percentage of women in

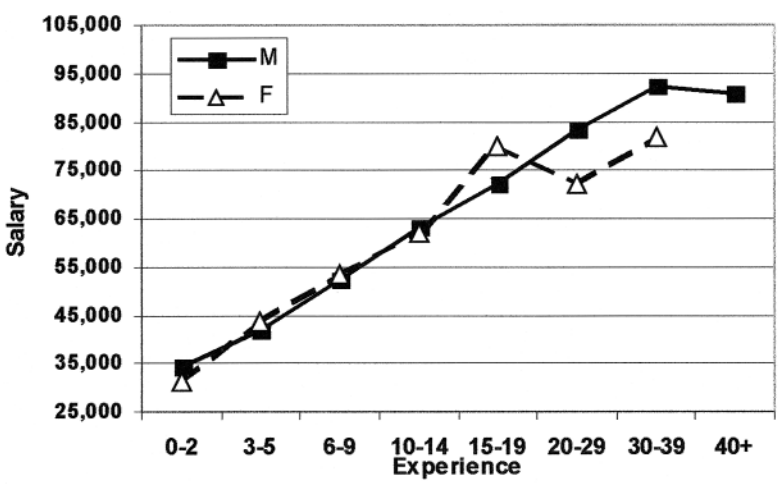


FIG. 7. Average annual salary as a function of the number of years of experience for men and women. This plot includes salary data collected only for those reporting full-time employment. Both 9- and 12-month academic appointments were considered full time. See text for reason behind selection of this dataset. When there were less than five respondents in a category, the data were omitted.

each age group has increased, except for a small decrease in the 60–69-year-old group, since 1993. This reflects the overall gains in the female population, especially the increase in young female meteorologists entering the field since the last survey was conducted in 1993. Of the respondents in the 20–24 age group, 30.9% identified themselves as female. Only 3% of those who identified themselves as retired were women.

Based on the demographic data gathered by the survey, some gender specific information is noteworthy. For example, women were less likely to be married than men (76.6% of men vs 63.2% of women). Women made up a higher proportion of the African-American (18.6%), Asian (14.5%), and Native American (14.3%) respondents than suggested by the general sample, but were represented at lower levels in the other racial and ethnic groups (10.3% of Hispanics and 10.5% of whites). According to the 1998 NSF report, minority women composed 19% of the female labor force in science and engineering in 1995 and accounted for 4% of the entire workforce represented by these categories (NSF 1999).

Women in the sample tended to have less education than men, possibly reflecting the relative youth of the female membership. Of those respondents with a bachelor's degree, 13.8% were women. According to survey data, 9.1% of those with a master's degree were women and 9.6% of those with a doctorate were also of that gender. According to the NSF report published in 1998, women earned close to half of all bachelor degrees in science and engineering (46%) back in 1995, 38% of all master's degrees, and represented 31% of all doctoral recipients (NSF 1999). It should be noted that women currently make up a large percentage of today's student population in the atmospheric and related sciences: 27.8% of graduate students and 22.8% of undergraduate students (AMS–UCAR 1998).

Women were more likely to be employed part time than men (13.1% of women vs 7.6% of men), or to be seeking employment (7.7% of women vs 4.3% of men). Women were also more likely than men to be employed outside the fields represented by the Society (6.0% of women vs 4.0% of men). Women were underrepresented in supervisory positions with just 8.8% female supervisors, which is lower than the number of females reporting a managerial role (18%) in science and engineering in 1995 (NSF 1999).

Women tended toward lower-paying positions than men. The median salary for women was about $51,000 whereas the median salary for men was roughly $63,000. The percentage of those earning more than $100,000 per year was more than twice as high for men as for women (6.2% of women vs 13.2% of men), which may reflect the relative youth of the female survey population.

TABLE 7. Average annual salary (in thousands of dollars) for women and men by employment sector and years of experience. Only those employed full time were included. When there were less than five respondents in a category, the data were omitted.

Experience (years)	Female ($)	Male ($)
Government		
0–2	42,188	36,513
3–5	44,000	43,051
6–9	44,265	52,993
10–14	58,879	61,457
15–19	70,208	68,104
20–29	75,000	78,548
30–39	–	87,392
40 <	–	81,406
Private		
0–2	30,250	30,219
3–5	41,250	36,700
6–9	48,833	53,897
10–14	56,176	63,693
15–19	56,111	66,768
20–29	54,375	81,032
30–39	–	88,108
40 <	–	67,500
Radio/TV		
0–2	24,286	27,647
3–5	45,156	42,736
6–9	86,591	53,598
10–14	82,708	73,506
15–19	111,944	94,375
20–29	–	107,669
30–39	–	112,955
40 <	–	85,000
University		
0–2	20,658	31,141
3–5	25,476	30,508
6–9	39,022	42,703
10–14	58,571	52,681
15–19	53,889	65,190
20–29	66,818	79,356
30–39	–	88,118
40 <	–	78,700

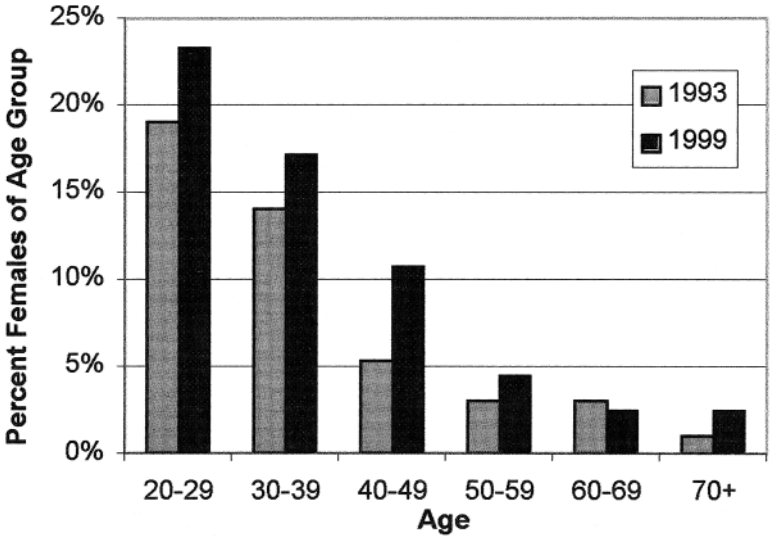


FIG. 8. Distribution of women respondents to the 1993 and 1998 surveys given as a percentage within each age group.

Although there may exist a perception that women have entered academia and the media in greater numbers over the recent years, the survey results do not necessarily reflect this trend. Of those respondents working in television and radio, 12.9% were women. Of those respondents who were professors, 7.4% of those with tenure were female. Only 29.3% of female professors were tenured, whereas 43.2% of male professors had achieved this status. A similar disparity existed in 1995 among the general population of scientists and engineers (NSF 1999).

The relative youth of the female population in the sample, coupled with past trends, suggest that the number of women in the atmospheric and related sciences will likely increase during the twenty-first century. As more women gain experience and their time in the workplace increases, they may be more likely to gain high-paying, supervisory, and tenured employment.

h. Career development: Impact of personal/workplace circumstances on professional career

Social scientists continue to forecast increasing diversity in the workforce of the new millennium. It is expected that women, underrepresented racial/ethnic groups (e.g., blacks, Hispanics, Native Americans, and Asian/Pacific Islanders), and citizens with disabilities will play a major role in an increasingly diverse workforce. Yet, demographic data from the 1999 AMS survey continue to indicate that these groups are severely underrepresented in the Society. Race, gender, and disability, along with other personal circumstances such as marital status, sexual orientation, and responsibility for dependents can have an impact on the development of a professional career in the atmospheric or related sciences. Furthermore, workplace circumstances such as hiring practices, affirmative action programs, job sharing, or telecommuting can dictate the growth and development of a professional in the field over time. This section presents some of the responses to the 1999 survey relating to the impact of personal and workplace circumstances on the advancement of those individuals in the Society. This section of the survey was restructured by the Board on Women and Minorities to elicit more declarative responses to this intricate line of questioning and to provide a means of data analysis not accomplished in previous surveys (see the appendix to review survey questions on personal and workplace circumstances). Though previous surveys (e.g., 1993) collected such data, this paper represents the first attempt to publish and analyze responses of this nature by the Society.

1) PERSONAL CIRCUMSTANCES ON CAREER ADVANCEMENT

Figure 9 shows the structure of the series of questions asked to address the issues of personal circumstances on career advancement. Each subsection below provides a discussion of the responses for the question represented by the blank being filled in with the title of that subsection.

My _____ has impacted my career in the following manner:

- Enhanced opportunity to advance in salary or responsibility
- Hindered opportunity to advance in salary or responsibility
- Enhanced opportunity to attain new skills/knowledge
- Hindered opportunity to attain new skills/knowledge
- No impact

FIG. 9. These selections were provided for questions pertaining to marital status, race/ethnic identity, gender, sexual orientation, disability, and dependents.

(i) Marital status

As noted earlier, men (76.6%) are more likely than women (63.2%) to be married. Table 8 indicates that most Society members do not believe that marital status has impacted their career. However, a sizeable sample (15%) does believe that their marital status has positively impacted their ability to advance in salary or skill level. About 42% of women and 31% of men said that their marital status affected their salary and skills. Though women were evenly split between their marital status enhancing and hindering their salaries, women were just over three times more likely than men to say that their marital status enhanced their skills.

TABLE 8. Survey responses (%) to questions pertaining to the impact of various personal circumstances on career advancement.

	Marital status	Race/ ethnicity	Gender	Sexual orientation	Disability	Dependent care
Enhanced salary	16.7	4.4	8.2	2.8	0.1	1.2
Hindered salary	8.1	7.7	9.3	1.0	0.9	8.7
Enhanced skills	14.9	2.5	3.9	1.1	0.1	0.8
Hindered skills	6.1	1.8	2.3	0.3	0.6	8.8
No impact	68.8	87.4	81.0	96.0	3.2	74.0

(ii) Gender and race

Over 80% of the respondents felt that gender or race had no impact on their career advancement (Table 8). However, this result deserves further investigation as the demographics of the Society may bias this response. Reflecting on demographic data from the 1999 survey, 92% of respondents were white and 89% were male. This means that roughly 8% of the respondents are minorities and 11% of the respondents are women. More specifically, the breakdown of minority respondents is as follows: black or African-American (0.9%), Native American (0.6%), Hispanic (1.5%), and Asian/Pacific Islander (5.2%). Examining Table 8 more closely, some interesting correlations emerge. Almost 8% of the respondents felt that race/ethnicity had negatively impacted their ability to advance in salary. This number is very close to the aggregate percentage of minorities responding. Similarly, over 9% of the respondents felt that gender had negatively impacted their ability to advance in salary. This number is very close to the 11% response rate for women.

Though it cannot be conclusively stated that minorities and women account for these specific responses, there is strong evidence that this may be the case. For example, about 47% of women and 16% of men said that gender impacted their salaries and skills. Of these responses, slightly more women said that gender hindered their salary rather than enhanced it, but women were evenly split over whether their gender hindered or enhanced their skills.

Furthermore, it is likely that the large percentage of "no impact" responses is due to the overwhelmingly large body of nonminority/nonfemale respondents to the survey. This dataset will require a more thorough analysis before conclusive findings can be published.

(iii) Sexual orientation and persons with disabilities

A large majority of the Society (96%) responded that sexual orientation and disability have not impacted their career. However, this is likely reflective of a poor sample of homosexuals and members with disabilities. In fact, only 3.3% of the membership indicated a disability. This is down from 3.6% in 1993. There exists no reliable historical demographic data on the number of homosexual members in the Society given that the 1999 survey was the first attempt to solicit information on sexual orientation.

(iv) Dependent care

Roughly 2504 (54%) of the respondents addressed the question about dependent care and the majority of them (74%) felt that it did not impact their career. However, it is significant that almost 9% of respondents did indicate a negative impact on career advancement due to dependant care responsibilities. The largest group of dependents was found to be within the age group of 6–12-years old, which is consistent with findings of the 1993 survey. Over 21% of the respondents claimed dependents over 50 years of age compared with 23% in 1993.

Over the last five years, I think the career advancement of _____ has:

- Improved, but is still below what it should be
- Improved and is now close to or at an acceptable level
- Gotten worse
- Remained the same and is below where it should be
- Remained the same and is close to or at where it should be

FIG. 10. These selections were provided for questions pertaining to the advancement of women, minorities, and persons with disabilities reflecting on the last five years.

2) DIVERSITY IN THE WORKPLACE

Figure 10 shows the structure of the series of questions asked to address how the workplace has changed in the past five years. Each subsection below provides a discussion of the responses for the question represented by the blank being filled in with the title of that subsection.

According to Table 9, all groups are perceived by Society members to be making strides in terms of career advancement. Further analysis, indicates that 42%–44% of those who think advancements have been made still feel that there is room for improvement. This indicates that a large portion of nonminority and nonfemale members acknowledge that certain groups remain underrepresented in AMS-related fields. It should also be noted that, in general, women and men tended to view diversity issues differently given the percentages of their responses to the questions posed.

(i) Women

The majority of respondents (82.5%) said that career advancement of women in the atmospheric and related sciences had improved in recent years. Answers differed based upon the gender of the respondent with 73% of women and 84% of men stating that career advancement had improved. However, 85% of women and 50% of men said that career advancement was not at an acceptable level. About 44% of women and 29% of men felt that women were underrepresented in their workplace.

(ii) Minorities

By compiling the totals from Table 9, almost 76% of respondents indicated that there have been improvements for minorities in terms of career advancement in the last five years. About 66% of women and 78% of men responded that career advancement of minorities in the field had improved. About 77% of women and 56% of men responded in the affirmative that the status of minorities in the field was below an acceptable level. About 51% of women and 34% of men responded that minorities were underrepresented in their workplace.

(iii) Persons with disabilities

About 65% of women and 70% of men responded that the status of those with physical disabilities had improved during the last five years. Whereas 78% of women said that the number of those with disabilities was below an acceptable level, 59% of men responded similarly. About 48% of women and 29% of men responded that people with physical disabilities were underrepresented in their workplace.

3) HIRING AND ADVANCEMENT

When asked about the hiring and advancement practices in their workplace (see the appendix to review survey), 34% of respondents thought that enhancing diversity was an important consideration while 29% thought that it was a minor consideration. Another 23% were not sure. Almost 14% felt that diversity was not considered at all. Men were more likely than women to feel that diversity was an important consideration in hiring practices in their workplace (35% of men vs 22% of women).

TABLE 9. Survey responses (%) to questions pertaining to the career advancement of women, minorities, and persons with disabilities.

Career advancement in the last five years:	Women	Minorities	Physically challenged
Improved but still low	44.2	42.1	42.7
Improved but acceptable	38.3	33.7	26.8
Gotten worse	0.6	2.0	0.8
Remained low	8.4	13.2	17.3
Remained low but acceptable	8.3	8.8	12.2

4) Diversity trends

When asked how diversity has changed in their workplace in the past five years, nearly half (49%) felt that it had remained the same while 46% observed increases and 3% of respondents noted a decrease in diversity.

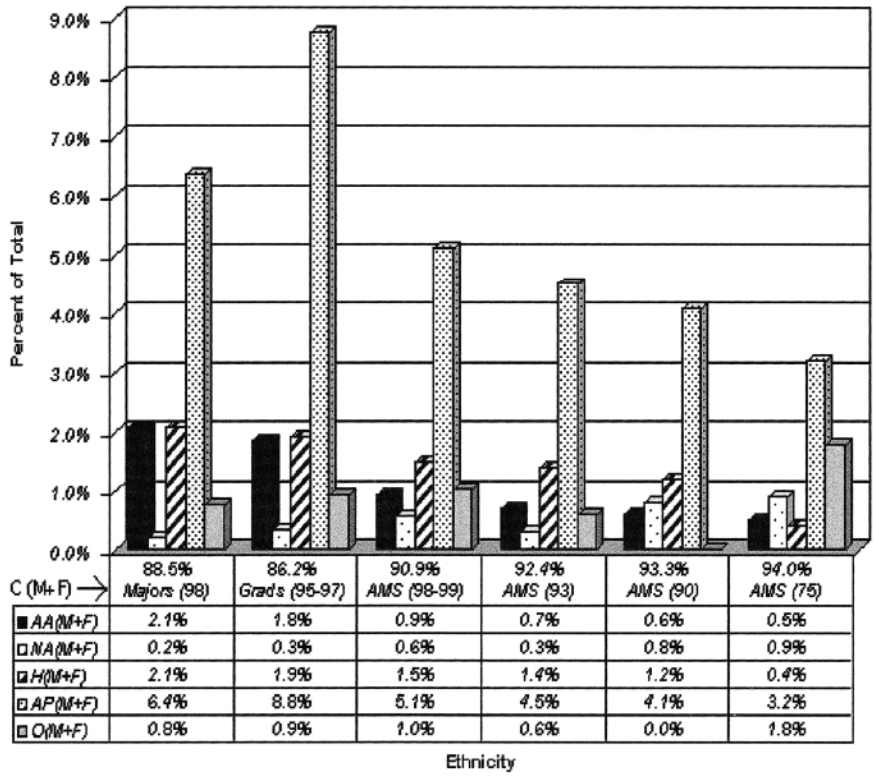
5) Affirmative action

Over 79% of the respondents felt that affirmative action had not impacted their career. While 15% felt that it had hindered their career (e.g., ability to advance in salary or responsibility). About 18% of women felt that affirmative action had enhanced their salaries, whereas only 1% of men agreed. However, 4% of women and 17% of men felt that affirmative action policies had hindered their salaries.

It is interesting to note that only 1%–3% of the respondents claimed any positive benefit from affirmative action. However, this result may again indicate the bias created by the overwhelming majority of respondents that belong to a male, nonminority demographic. In light of statistics from recent surveys (e.g., 1993 and 1999) suggesting that underrepresentation of women and minorities is quite prevalent and that affirmative action has not impacted a majority of respondents (79%), it seems appropriate to continue or expand efforts that seek to mitigate underrepresentation and promote diversity.

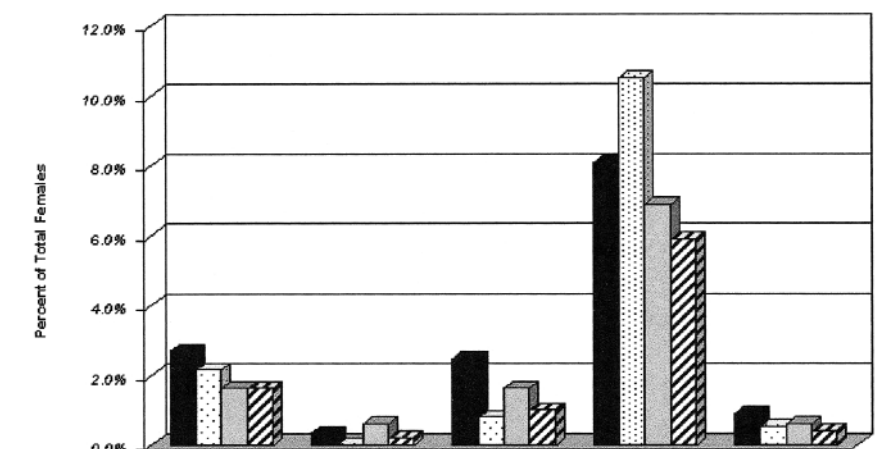
i. The academic pipeline

The previous sections indicate that the underrepresentation of women, minorities, and workers with disabilities continues to exist. An assessment of



C (M+F) →	88.5% Majors (98)	86.2% Grads (95-97)	90.9% AMS (98-99)	92.4% AMS (93)	93.3% AMS (90)	94.0% AMS (75)
AA(M+F)	2.1%	1.8%	0.9%	0.7%	0.6%	0.5%
NA(M+F)	0.2%	0.3%	0.6%	0.3%	0.8%	0.9%
H(M+F)	2.1%	1.9%	1.5%	1.4%	1.2%	0.4%
AP(M+F)	6.4%	8.8%	5.1%	4.5%	4.1%	3.2%
O(M+F)	0.8%	0.9%	1.0%	0.6%	0.0%	1.8%

Fig. 11. Race/ethnic percentages of those majoring in the atmospheric and related sciences for both males and females in 1998 and those graduates from the years 1995–97, compared with AMS survey totals from 1999, 1993, 1990, and 1975 where C = Caucasian, AA = African-American, NA = Native American, H = Hispanic, AP = Asian/Pacific Islander, and O = Other.



	AA(F)	NA(F)	H(F)	AP(F)	O(F)
Majors (98)	2.7%	0.3%	2.5%	8.1%	0.9%
Grads (95-97)	2.2%	0.0%	0.8%	10.5%	0.5%
AMS (98-99)	1.6%	0.6%	1.6%	6.9%	0.6%
AMS (93)	1.6%	0.2%	1.0%	5.9%	0.4%

Fig. 12. The percentage of females as a function of the total number of females represented in each racial/ethnic category based upon totals from those majoring in atmospheric and related sciences in 1998, graduates from 1995 to 1997, and AMS survey data from 1999 and 1993.

the composition of students in the educational pipeline was conducted using past AMS survey data and data from up to 86 colleges/universities granting AMS-related degrees (AMS–UCAR 1998). The results are shown in Figs. 11 and 12. In the case of ethnic categories, there appears to be a gradual increase in the number of African-Americans/blacks in the pipeline from 1975 (0.5%) to the present (2.1%). Hispanic and Asian/Pacific islander groups also show gains (0.4% to 2.1%) and (3.2% to 6.4%), respectively. Native Americans numbers actually decline (0.9% to 0.2%). According to NSF (1999), in 1994, 20.6% of all undergraduate students were underrepresented minorities. In 1995, blacks, hispanics, and native Americans earned 13% of all bachelor degrees in science and engineering (NSF 1999).

As for gender, females in all ethnic groups have made slight gains since 1975. African-American females have increased from 1.6% to 2.7%. Native American females have increased from 0.2% to 0.3%. Hispanic females increased from 1.0% to 2.5%. Finally, Asian/Pacific islander females increased from 5.9% to 8.1%.

Though the overwhelming majority of numbers suggests that the diversity represented in the academic pipeline has grown over time, the relative magnitude of such growth has been small. Certainly, the trend is in a positive direction; yet, the population represented in the pipeline is likely to be insufficient to drastically diversify the Society within the next 5–10 years. This highlights the continual need for outreach programs, diversity awareness, and strategies to provide opportunities for all races, genders, and workers with disabilities.

TABLE 10. Types of benefits and work programs available to survey respondents (in %).

Program offered	
Parental leave	51.2
Daycare	42.9
Work at home	15.4
Participatory management	26.0
Training programs	13.7
Continuing education	57.7
Job sharing	53.8
Other programs	5.8
None of the above	3.3
Left blank	17.6

j. Other workplace issues

In addition to workplace circumstances related to race, gender, and disability, the Society is also interested in the types of workplace benefits and alternative programs offered to its membership by their employers. Table 10 reviews the types of benefits or alternative programs offered to Society members. The most popular (in terms of availability to Society members) benefits or programs include parental leave (51%), continuing education (58%), job sharing (54%), and part-time work (43%). Roughly 13.5% of the respondents did not have access to any of the programs listed. Work leave and training/educational opportunities continue to be the most popular benefits among employers. Over the next few years, it will be interesting to monitor the fluctuations in these numbers as less-traditional programs like cross-training and telecommuting become more prolific.

Written responses to the survey offered several additional ideas including flex-time schedules, sabbaticals, mentoring, maternal leave programs, flexible spending accounts, professional dues/journal subscriptions paid, legal services, and teaching opportunities. It should be noted that 84% of women and 55% of men felt that the AMS should address workplace issues in the future.

4. The Society speaks: Anecdotal information from the survey

The final section of the survey, relating to additional issues of interest to the membership, posed the following open-ended question to the survey respondents: *Do you have any suggestions to improve the opportunities for women and minorities in the AMS-related sciences?*

The responses to this question numbered 550 written comments. The ideas outlined in these comments were diverse in their intent, ranging from suggestions for improvement to extreme agitation over the efforts of the Board on Women and Minorities. Selected examples

TABLE 11. Suggestions for improvement: The following are comments taken directly from the written responses to the 1999 AMS survey on suggestions for improvement.

- If we are going to improve opportunities, we need to start in the elementary and junior high schools to interest women and minorities in science . . . the biggest drawback to hiring women and minorities is that there are so few of them in the pipeline.
- Increase opportunities for all persons regardless of their gender or ethnicity.
- Encourage high school students; expand K–12 activities to encourage students before graduating from secondary schools.
- Sponsor seminars at universities/offer mentor programs.
- Provide recruiting visits starting at the high school level.
- Abolish affirmative action.
- Support affirmative action.
- We are open to hiring the best person possible. The key is education, experience, and the ability to fit in with fellow meteorologists.
- Establish awards for achievement and the mentoring of women and minorities.
- Stop pointing out that we *are* women and minorities. This action alienates male majorities, which creates tension and leads to further racism and sexism. Find out what other organizations are doing to solve the same problems.
- Better opportunities and increased salaries will attract quality people.
- Publish special issues to celebrate women and minorities in the field.
- Encourage, encourage, encourage!
- Education, education, education!
- Just keep tabs on fairness. Do not encourage reverse discrimination, however. Encourage an open sex-blind and color-blind policy.
- Offer opportunities for amateur weather observers.
- Start a Web page listserv to get women and minorities talking to each other.
- Work harder than anyone else.

TABLE 12. Improvements not required: The following are comments taken directly from the written responses to the 1999 AMS survey citing that no improvements are required.

- No, there are no problems in this area! Focus on something else!
- It's fine the way it is. People need to be knowledgeable and competent regardless of race or gender.
- The opportunities exist. The question is one of continuous preparation of quality institutions throughout the individual's career.
- Please cease being so politically correct!
- Diversity = reverse discrimination.
- I believe in equal pay regardless of race or gender. I don't think the AMS needs to get into racial diversity/sexual orientation/personal issues . . . keep it professional!
- Frankly, what else can you do? Everyone knows the law and knows what it takes to be qualified for a particular position. Further consideration given to race and gender in this day and age only serves to polarize and separate races and the sexes.
- Encourage educational avenues not quotas.
- Do nothing! Opportunities for women and minorities are already greater than those for men and nonminorities.
- I believe a strict meritocracy will be the best for all.
- Obtain the education and the experience needed. Show job dedication and value of your work.

of these broad ranging comments are provided in Tables 11–14 with the intent of enlightening members on the varying perspectives held by those in the Society.

a. Statistics

The majority of written comments (55%) could be construed as positive suggestions. Still a significant proportion (37%) did not support the belief that opportunities need to be improved for women and minorities. Suggestions for the improvement of the survey itself accounted for 4% of the comments. Other members (1%) focused on retirement issues and the remaining comments (3%) covered miscellaneous issues.

b. Conclusions on written comments

Those respondents electing to provide written comments at the end of the AMS survey presented many issues. While some of the issues have been of concern to the Society for many years, some spoke to new concerns now attempting to be addressed by the BWM and the Society at large. The results of this section of the survey challenge the membership to look at the issue of improving opportunities for women and minorities in the AMS-related sciences while also addressing new concerns highlighted by members through the survey.

5. Summary and conclusions

The 1999 survey results continue the longitudinal profile of Society membership begun a quarter of a century ago. This analysis strives to maintain the continuity of baseline data gathered over the years, while expanding on issues impacting career advancement. The hope is to provide insight and leadership as the workforce becomes more diverse over the course of this new century, while remaining sensitive to the needs of the Society.

TABLE 13. Retirement issues: The following are comments taken directly from the written responses to the 1999 AMS survey regarding retirement issues.

- Fight compulsory retirement. Age discrimination is one type of discrimination that you don't mention.
- More consideration should be given to retirees. Reduced income is the norm for retirees. Meeting registration fees and journals fees should be reduced for retirees.

TABLE 14. Miscellaneous comments: The following are comments taken directly from the written responses to the 1999 AMS survey pertaining to miscellaneous comments.

- More journal choices.
- Abolish the Board on Women and Minorities.
- Confronting the prejudice of some supervisors related to sexual orientation should be a primary issue addressed.
- Do not ignore the potential contributions of the disabled. Give us the opportunity to prove our worth in positions previously declared "off limits" for the disabled.
- Daycare facilities would be a huge benefit.
- Open the AMS library to AMS members.

This study analyzed the membership results from various perspectives, focusing on the breakdown of data by age, gender, ethnic group, employment sector, and years of experience, among other categories. Newly explored territory detailing the impact of personal and workplace circumstances on the professional growth of those in the Society attempted to tackle complex issues facing the membership today. Often times, sample populations of women and minorities were too small to elicit results that could be considered noteworthy.

Overall, the data results support previous survey findings indicating a Society largely populated by more senior members (39% of Society have been members for over 20 years) and the continued modest increase of the female population. The gap in salary between younger male and female members seems to be vanishing; however, the large disparity between the number of Caucasians and those representing minority populations continues with miniscule growth noted across the various racial/ethnic categories.

Although the dataset richly reflects the Society at large, the results cannot necessarily be taken as an extension of the general population of those employed in the atmospheric and related sciences. Still, it seems prudent to continue such survey efforts. The results will help craft programming to ensure the continued growth of the Society and the people it works to serve.

Acknowledgments. Members of the AMS Board on Women and Minorities helped to craft the 1999 membership survey. Thanks to the dedication and hard work of members on the board, this formal analysis of the 1999 survey data has been made available to the membership. The skillful guidance of Deputy Executive Director Keith Seitter led our charge. Keith proved to be an invaluable resource as he thoughtfully assisted the board in every step of the data analysis and processing. These results build upon an existing framework that will help set the agenda for AMS initiatives and workplace practices in the AMS-related sciences as we embark on our journey into the new millennium.

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Appendix: Survey of Society Membership and Issues in the Workplace

AMERICAN METEOROLOGICAL SOCIETY

SURVEY OF SOCIETY MEMBERSHIP AND ISSUES IN THE WORKPLACE

Please complete the following survey (It requires approximately 15 minutes to complete), and return it in the enclosed envelope or with your dues statement.
Participation in this survey is *voluntary* and your anonymity will be preserved.
You may choose to not answer any question without invalidating the survey.
Thank you for your time and input.

MARKING INSTRUCTIONS
Use pen or pencil, but do not use red.
Make dark marks that fill oval completely.
Make erasures cleanly.
RIGHT MARK ● WRONG MARKS ⊘ ✓ ⊗

I. DEMOGRAPHIC INFORMATION

A. Age:
- ○ <20
- ○ 20 - 24
- ○ 25 - 29
- ○ 30 - 34
- ○ 35 - 39
- ○ 40 - 44
- ○ 45 - 49
- ○ 50 - 54
- ○ 55 - 59
- ○ 60 - 64
- ○ 65 - 69
- ○ 70 & Over

B. Gender:
- ○ Male
- ○ Female

C. Current Marital Status:
- ○ Single
- ○ Married
- ○ Widowed
- ○ Divorced or Separated
- ○ Partnered (Unmarried)

D. Race/Ethnicity: (*Mark all that apply*)
- ○ White
- ○ African-American/Black
- ○ Native American/Eskimo/Aleut
- ○ Hispanic
- ○ Asian or Pacific Islander
- ○ Other (*Specify*) _____

E. Citizenship: (*All currently living in the U.S.*)
- ○ U.S. Citizen
- ○ Non-U.S. Citizen, Temp. Visa
- ○ Non-U.S. Citizen, Permanent Visa
- ○ Other Non-U.S. Citizen

F. Location of Residence:
- ○ New England (*ME, NH, VT, MA, RI, CT*)
- ○ Capital Area (*DC, MD, VA*)
- ○ Middle Atlantic (*NY, DE, NJ, PA, WV*)
- ○ South Atlantic (*NC, SC, GA, FL, AL*)
- ○ South Central (*KY, TN, MS, AR, LA, OK, TX*)
- ○ North Central (*OH, IN, IL, MI, WI, MN, IA, MO, ND, SD, NE, KS*)
- ○ Mountain (*MT, ID, WY, CO, NM, AZ, UT, NV*)
- ○ Pacific (*WA, OR, CA, AK, HI*)
- ○ American Somoa/Guam/ Marshall Islands
- ○ Puerto Rico/Virgin Islands
- ○ Carribean Islander (Non-U.S.)
- ○ Mexico/Central America
- ○ Canada
- ○ Australia and Pacific Islands
- ○ Europe (including Russian Rep.)
- ○ Africa
- ○ Asia
- ○ South America
- ○ Antarctica

G. Physically Challenged:
- ○ No
- ○ Yes

(*Please explain*) _____

II. EDUCATION

A. Highest Degree Obtained:
- ○ High School
- ○ Associate's
- ○ Bachelor's
- ○ Master's
- ○ Doctorate
- ○ Other

B. Indicate field of major:

BS / BA	MS / MA	PH.D / D.SC	
○	○	○	Agriculture/Agronomy
○	○	○	Astronomy
○	○	○	Atmos. Sci./Meteorology
○	○	○	Biological Science
○	○	○	Business
○	○	○	Chemistry
○	○	○	Climatology
○	○	○	Communications
○	○	○	Computer Science
○	○	○	Economics
○	○	○	Education
○	○	○	Engineering
○	○	○	Geography
○	○	○	Geology/Geophysics
○	○	○	History
○	○	○	Hydrology
○	○	○	Journalism
○	○	○	Law
○	○	○	Mathematics
○	○	○	Oceanography
○	○	○	Physics
○	○	○	Physical Science
○	○	○	Social Science
○	○	○	Statistics
○	○	○	Other

(*Specify*) _____

III. CURRENT EMPLOYMENT

A. Employment Status: (*Mark all that apply*)
- ○ Employed full time
- ○ Employed part time
- ○ Unemployed*
  - ○ Seeking
  - ○ Not Seeking
- ○ Employed in job outside the atmospheric, oceanic, hydrospheric, and related sciences*

If you marked this choice go directly to Section IV.

B. Additional Status: (*if applicable*)
- ○ Graduate Student
- ○ Undergraduate Student
- ○ Retired

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III. CURRENT EMPLOYMENT

C. Indicate employer:

PRIMARY	SECOND	
○	○	Federal government civilian
○	○	Federal government military
○	○	State/County government
○	○	Municipal/local government
○	○	Government sponsored lab.
○	○	Other research institution
○	○	International Org.
○	○	Utility Industry
○	○	Aviation Industry
○	○	Radio/TV Station
○	○	Private data and forecasting
○	○	Private consulting firm
○	○	Contracting/systems firm
○	○	Instrument manufact.
○	○	University/college
○	○	Precollege edu. inst
○	○	Non-profit org./inst.
○	○	Self-employed
○	○	Other business-private*
○	○	Other educational inst.*
○	○	Other*

**If "Other", please specify:* _____

D. Indicate current position:

PRIMARY	SECOND	
○	○	Applied meteorologist
○	○	Applied research meteorologist
○	○	Basic research scientist
○	○	Broadcast meteorologist
○	○	Entrepreneur
○	○	Computer scientist
○	○	Consultant
○	○	Designer of equip/processes
○	○	Dev/Manuf of equip., prod., or services
○	○	Editor
○	○	Engineer
○	○	Forecaster
○	○	Forensic meteorologist
○	○	Hydrologist
○	○	Meteorological technician
○	○	Mgmt/admin of educational program
○	○	Mgmt/admin of finance
○	○	Mgmt/admin of R & D
○	○	Mgmt/admin of services
○	○	Oceanographer
○	○	Professor tenure track
○	○	Professor non-tenure track
○	○	Program Manager
○	○	Programmer
○	○	Sale, marketing, cust. & pub. relations
○	○	Student
○	○	Teacher/Instructor
○	○	Technician
○	○	Weather observer
○	○	Writer
○	○	Other (*Specify*): _____

E. Position Level: ***(If Broadcast Meteorologist, go to F.)***

- ○ Entry Level *(e.g., Asst. Prof., Instructor, Scientist I, Intern)*
- ○ Midlevel *(e.g., Asst. Prof., Scientist II, Journeyman)*
- ○ Senior level *(e.g., Full Prof., Scientist III, MIC, SOO, Lead Forecaster)*
- ○ Executive level *(e.g., Director, Chair, President)*

III. CURRENT EMPLOYMENT

F. Position Level - *Broadcast Meteorologist*

PRIMARY	SECOND	
○	○	Part-time/freelance (do not appear weekly)
○	○	Weekend Meteorologist (am or pm)
○	○	Weekday Meteorologist
○	○	Chief Meteorologist

G. Do you have any supervisory responsibilities?

○ Yes ○ No

H. If applicable, are you tenured?

○ Yes ○ No

I. Experience: Number of years . . .

with your present principal employer

○ 0 - 2	○ 6 - 9	○ 15 - 19	○ 30 - 39
○ 3 - 5	○ 10 - 14	○ 20 - 29	○ 40 & Over

you have been employed in current position

○ 0 - 2	○ 6 - 9	○ 15 - 19	○ 30 - 39
○ 3 - 5	○ 10 - 14	○ 20 - 29	○ 40 & Over

you have been employed in the AMS-related sciences

○ 0 - 2	○ 6 - 9	○ 15 - 19	○ 30 - 39
○ 3 - 5	○ 10 - 14	○ 20 - 29	○ 40 & Over

J. Workload: (*Sum should total unity*)

POSITION	AMOUNT OF TIME						
	0	1/4	1/3	1/2	2/3	3/4	ALL
Research	○	○	○	○	○	○	○
Applied/Service	○	○	○	○	○	○	○
Teaching	○	○	○	○	○	○	○

K. Total Annual Income (in U.S. Dollars) from activities in the atmospheric and related oceanic and hydrologic sciences (including consulting, bonuses, summer employment, etc.):

○ Less than $10,000	○ $ 80,000 – $ 99,999
○ $10,000 – $19,999	○ $100,000 – $119,999
○ $20,000 – $29,999	○ $120,000 – $149,999
○ $30,000 – $44,999	○ $150,000 – $199,999
○ $45,000 – $59,999	○ $200,000 & over
○ $60,000 – $79,999	

IV. PERSONAL CIRCUMSTANCES

Impact of personal circumstances on your professional career

A. My current marital status has impacted my career in the following manner: (*Mark all that apply*)

- ○ Enhanced opportunity to advance in salary or responsibility
- ○ Hindered opportunity to advance in salary or responsibility
- ○ Enhanced opportunity to attain new skills/knowledge
- ○ Hindered opportunity to attain new skills/knowledge
- ○ No impact

B. My race/ethnic identity has impacted my career in the following manner: (*Mark all that apply*)

- ○ Enhanced opportunity to advance in salary or responsibility
- ○ Hindered opportunity to advance in salary or responsibility
- ○ Enhanced opportunity to attain new skills/knowledge
- ○ Hindered opportunity to attain new skills/knowledge
- ○ No impact

IV. PERSONAL CIRCUMSTANCES

Impact of personal circumstances on your professional career

C. My gender has impacted my career in the following manner: (*Mark all that apply*)

- ○ Enhanced opportunity to advance in salary or responsibility
- ○ Hindered opportunity to advance in salary or responsibility
- ○ Enhanced opportunity to attain new skills/knowledge
- ○ Hindered opportunity to attain new skills/knowledge
- ○ No impact

D. My sexual orientation has impacted my career in the following manner: (*Mark all that apply*)

- ○ Enhanced opportunity to advance in salary or responsibility
- ○ Hindered opportunity to advance in salary or responsibility
- ○ Enhanced opportunity to attain new skills/knowledge
- ○ Hindered opportunity to attain new skills/knowledge
- ○ No impact

E. My disability has impacted my career in the following manner: (*Mark all that apply*)

- ○ Enhanced opportunity to advance in salary or responsibility
- ○ Hindered opportunity to advance in salary or responsibility
- ○ Enhanced opportunity to attain new skills/knowledge
- ○ Hindered opportunity to attain new skills/knowledge
- ○ No impact
- ○ Not applicable

F. Please enter the number of dependents in each age category who require your care (*or mark None*):

○ None

	# OF DEPENDENTS					
	1	2	3	4	5	6
0 - 3 yrs.	○	○	○	○	○	○
4 - 5 yrs.	○	○	○	○	○	○
6 - 12 yrs.	○	○	○	○	○	○
13 - 17 yrs.	○	○	○	○	○	○
18 - 29 yrs.	○	○	○	○	○	○
30 - 49 yrs.	○	○	○	○	○	○
50 - 59 yrs.	○	○	○	○	○	○
60 - 69 yrs.	○	○	○	○	○	○
70 & over	○	○	○	○	○	○

G. My need to care for dependents (elderly or young) has impacted my career in the following manner: (*Mark all that apply*)

- ○ Enhanced opportunity to advance in salary or responsibility
- ○ Hindered opportunity to advance in salary or responsibility
- ○ Enhanced opportunity to attain new skills/knowledge
- ○ Hindered opportunity to attain new skills/knowledge
- ○ No impact
- ○ Not applicable

H. Over the last five years, I think the career advancement of women has:

- ○ Improved, but is still below what it should be
- ○ Improved and is now close to or at an acceptable level
- ○ Gotten worse
- ○ Remained the same and is below where it should be
- ○ Remained the same and is close to or at where it should be

I. Over the last five years, I think the career advancement of minorities has:

- ○ Improved, but is still below what it should be
- ○ Improved and is now close to or at an acceptable level
- ○ Gotten worse
- ○ Remained the same and is below where it should be
- ○ Remained the same and is close to or at where it should be

J. Over the last five years, I think the career advancement of the physically challenged has:

- ○ Improved, but is still below what it should be
- ○ Improved and is now close to or at an acceptable level
- ○ Gotten worse
- ○ Remained the same and is below where it should be
- ○ Remained the same and is close to or at where it should be

V. WORKPLACE CIRCUMSTANCES

Impact of workplace circumstances on your professional career

A. The hiring and advancement practices in my workplace can be described by which of the following:

- ○ Enhancing workplace diversity is not considered when hiring new employees or advancing present employees.
- ○ Enhancing workplace diversity is only a minor consideration in the hiring and advancement of employees.
- ○ Enhancing workplace diversity is an important consideration when hiring and advancing employees.
- ○ I do not know about the practices in my workplace.

B. Over the past 5 years or so, diversity at my workplace has:

- ○ Remained the same
- ○ Increased
- ○ Decreased

C. Do you feel that any of the following are under-represented at your workplace? (*Mark all that apply*)

- ○ Women
- ○ Minorities
- ○ Physically challenged
- ○ None

D. Affirmative action programs have impacted my career in the following manner: (*Mark all that apply*):

- ○ Enhanced opportunity to advance in salary or responsibility
- ○ Hindered opportunity to advance in salary or responsibility
- ○ Enhanced job performance
- ○ Hindered job performance
- ○ No impact

E. Please mark all of the following that are offered in your workplace:

- ○ Parental leave
- ○ Part-time or intermittent work
- ○ Daycare
- ○ Work-at-home (telecommuting)
- ○ Participatory management
- ○ Training programs
- ○ Continuing education
- ○ Job-sharing
- ○ Other professional programs

(*Explain*) _____

- ○ None of the above

F. If you did not mark "none of the above" in Question E, please indicate whether the program(s) has impacted your career in any manner:

- ○ Enhanced opportunity to advance in salary or responsibility
- ○ Hindered opportunity to advance in salary or responsibility
- ○ Enhanced job performance
- ○ Hindered job performance
- ○ No impact

PLEASE TURN THE PAGE AND CONTINUE WITH PART VI. ADDITIONAL ISSUES

VI. ADDITIONAL ISSUES

A. Please indicate the primary factor that influenced your decision to pursue an AMS-related career:

- ◯ An experience
- ◯ Scholarship or fellowship opportunity
- ◯ Curiosity or interest in the subject matter
- ◯ Specific courses
- ◯ Specific teacher, professor, or mentor
- ◯ Job security
- ◯ Opportunity to make money
- ◯ Other

_____
(Explain)

- ◯ No primary factor

B. At what education level did the influence from Question A occur?

- ◯ Elementary/grade school
- ◯ Junior high/middle school
- ◯ High school
- ◯ Undergraduate
- ◯ Graduate
- ◯ Post-graduate
- ◯ Other

_____
(Explain)

C. What is the primary benefit of your AMS membership?

- ◯ Conferences/meetings
- ◯ *Bulletin of the AMS*
- ◯ Publications (Journals, etc.)
- ◯ Staying informed
- ◯ Job information
- ◯ Career advancement
- ◯ Local chapters
- ◯ All of the above
- ◯ Other

_____
(Explain)

D. How long have you been a member of the AMS?

- ◯ less than 2 years
- ◯ 2 - 5 years
- ◯ 6 - 10 years
- ◯ 11 - 20 years
- ◯ more than 20 years

E. If you have been a member of the AMS less than 2 years, what were your reasons for previous non-membership?

- ◯ Financial concerns
- ◯ Just entered the field
- ◯ Unaware of the AMS
- ◯ Forgot to renew/procrastination
- ◯ Negative views of the AMS
- ◯ Lack of interest in AMS activities
- ◯ Other

_____
(Explain)

F. Would a modest increase (additional five to ten dollars) in membership dues alter your decision to renew your AMS membership?

- ◯ Yes
- ◯ No

G. Are you aware of the AMS Board on Women and Minorities and its activities?

- ◯ Yes
- ◯ No

H. Should the AMS Board on Women and Minorities address workplace issues?

- ◯ Yes
- ◯ No

If yes, how? _____

_____

_____

_____

_____

Do you have any suggestions to improve the opportunities for women and minorities in the AMS-related sciences?

_____

_____

_____

_____

_____

_____

_____

_____

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