# Advances and Reflections: Efforts to include women in United States surveying and mapping, 1981-2001

**Wendy J. Woodbury STRAIGHT, USA**

**Key words**: Including Women in U.S. Surveying.

## ABSTRACT

In 1981, a study conducted by the American Congress on Surveying and Mapping (ACSM) and its member organization the National Society of Professional Surveyors (NSPS) concluded that women comprised only 1 percent of NSPS. Simultaneously, female surveyors in the United States were faced with trade journal advertisements for surveying equipment that featured women in swimsuits, lace garments, or other inappropriate attire for field surveying. In an effort to recruit women into the surveying profession, and in an effort to improve the professional atmosphere for those women already in the surveying profession, the NSPS Forum for Women in Surveying was created. From 1983 through the present, numerous outreach and retention activities have been conducted by the NSPS Forum for Women in Surveying. In general, those activities have successfully enhanced the diversity of the surveying profession in the United States. A number of successful offshoots of Forum activity have also enhanced professional diversity. From time to time over an eighteen-year period, opposition to the group has resulted in small setbacks that have proven to be relatively minor when compared with the overall professional acceptance of the Forum for Women in Surveying. For the past five years, the Forum for Women in Surveying has also been supportive of the FIG Task Force on Under-Represented Groups in Surveying.

## CONTACT

Wendy J. Woodbury Straight, Professional Land Surveyor
Woodbury Surveying and Geomatics
12 East Fifth Street
Dunkirk, NY 14048
New York
USA
Tel. + 1 716.366.1990
Fax + 1 716.366.4603
E-mail: wendy@netsync.net

# Advances and Reflections: Efforts to include women in United States surveying and mapping, 1981-2001

**Wendy J. Woodbury STRAIGHT, USA**

## 1. INTRODUCTION

There are sparse, anecdotal records, which indicate that a small number of female surveyors worked in the United States during the nineteenth and early twentieth centuries. It was not until after World War II, however, and more particularly in the late 1970s and early 1980s, that women entered the American surveying and mapping professions in slightly greater numbers. In 1981, a study conducted for the American Congress on Surveying and Mapping (ACSM) and for its member organization the National Society of Professional Surveyors (NSPS) concluded that there were no longer only one or two women in surveying; instead, female representation in surveying had grown to about 1 percent. By 1992, women comprised about 2 percent of the surveying and mapping industry in America (Boynton, 1992).

Though ACSM has not yet directed a follow-up study, it is roughly estimated that women in the United States surveying industry now number about 3 percent. Cultural factors have been among the reasons that the growth rate of women's participation in the American surveying profession has not been rapid. For example, a 1943 transportation article is representative of the attitudes of employers of that period. Throughout the 1940s and 1950s, it was generally believed that women in America were not suited for equal employment with men. The sample article was entitled, "Efficiency of Women Employees" and was written by L.H. Sanders. It was published in a magazine called *Mass Transportation*, which is currently on file at the Museum of Transportation in St. Louis, Missouri.

Statements from the article include the following:

*(1) There's no longer any question as to whether transit companies should hire women [due to the] manpower shortage. The important things now are how to select the most efficient women.*
*(2) If you can get them, pick young, married women, [because] they usually have more sense of responsibility; they're less likely to be flirtatious; as a rule, they need the work or they wouldn't be doing it.*
*(3) Older women who have never contacted the public have a hard time adapting themselves, are inclined to be cantankerous and fussy.*
*(4) General experience indicates that husky girls are more likely to be even tempered and efficient.*
*(5) Hire a physician to give each woman you hire a special physical examination, [which] reveals whether the employee-to-be has any female weaknesses. Transit companies report a surprising number of women turned down for nervous disorders.*
*(6) In breaking in women, stress at the outset the importance of time. Until this point is gotten across, service is likely to be slowed up.*

*(7) Give the female employee a definite day-long schedule, [since] they lack the initiative of finding work for themselves.*
*(8) Women are inclined to be nervous and they're happier with change.*
*(9) You have to make some allowance for feminine psychology. A girl has more confidence and consequently is more efficient if she can keep her hair tidied, apply fresh lipstick and wash her hands several times a day.*
*(10) Women are often sensitive; they can't shrug off harsh words in the way that men can do.*
*(11) Be reasonably considerate about using strong language around women.*
*(12) Get enough size variety in operator uniforms that each girl can have a proper fit.*

It is reasonable to assume that during this period, similar attitudes existed among American employers in all professions and trades, with the possible exceptions of teaching, nursing and library science. In the 1960s, however, the large American generation known as the "post-war baby boomers" came of age. Perhaps due to sheer numbers, more and more women began to seek employment in non-traditional fields, including surveying and mapping. Even though 1943 attitudes persisted, fortunate young women found moral support and encouragement from (1) their biological fathers in the surveying and mapping industry, and/or from (2) college and university programs that fostered the enrollment of women. A few fortunate women found work with enlightened employers, those who had learned that traditional attitudes were a form of discrimination. Other fortunate women were hired into government surveying programs through once popular measures known as "affirmative action" or "equal opportunity" initiatives. The United States Bureau of Land Management, for example, recruited several female graduates from accredited surveying and mapping programs to expand monumentation and mapping in the Alaskan frontier (Pinkerton, 1991).

## 2. THE FORUM FOR WOMEN IN SURVEYING

With the support of university programs and a few progressive employers, women therefore began to move into the surveying and mapping industry. Simultaneously, women surveyors were faced with trade journal advertisements that featured women in swimsuits, lace undergarments, or other inappropriate attire for field surveying. To a lesser degree, such advertisements were also found in professional literature and in trade show exhibits. By the early 1980s, there were enough women in the American surveying and mapping professions to propose that they form a discussion group, to address the advertising issue along with the issue of recruitment. In an effort to attract more women into the surveying and mapping professions, and to improve the professional atmosphere for those women already working in the industry, the Forum for Women in Surveying was created.

On March 15, 1983, the Forum convened as a committee of NSPS. Founders of the group had assumed that their progressive voice would be well received by the national association. That was not always the case, however. As Forum members were to learn later, the committee format that they had chosen gave control of the group to persons other than group members. Yet, Forum members were not deterred by the fact that the committee was occasionally under the control of men who had not been original members of the group, men who did not necessarily support the Forum's original goals. In spite of such occasions, the Forum

continued to conduct outreach and retention activities. In general, those efforts have enhanced the diversity of the surveying profession in the United States.

Within six months of its creation, the Forum had successfully sponsored an ACSM resolution calling for increased professionalism in advertising. The intent of the resolution was to eliminate sexist advertising from professional literature produced by NSPS and ACSM. Then, following the example set by ACSM, separately published trade journals also began to eliminate sexist advertising. The Forum's test for advertising has been widely adopted, a test through which questionable imagery of a woman is replaced by an image of a man of similar age, pose and attire; if the resulting image of the man is deemed ludicrous or laughable, the original advertisement is considered to have been offensive. The Forum's next campaign was undertaken to eliminate sexist language from professional literature. In 1986, at the Forum's urging, ACSM called for publication guidelines that eliminated language that "expresses and encourages discrimination." Many improvements were recommended, including the abolishment of the generic use of "man" and "mankind." Such terms were to be replaced with the words "humankind," "people," "humanity," "men and women," "all of us," or "we."

The ACSM policy adopted in 1986 was reaffirmed in 1988 and in 1991. It is entitled "Sexually Biased Language and Advertising," and it reads as follows:

*This general policy offers a positive approach intended to help eliminate gender as a bias within the industry. The policy covers the following two areas:*

*Publications*

*In all society publications and advertising, a conscious effort by the leadership and staff will be made to use words and phrases that are not sexually biased.*
*Members who submit entries for ACSM journals and publications will be encouraged to avoid sexual bias in their submissions. The ACSM staff can refuse a written submission, or, when appropriate, and with the author's approval, alter a written submission to make it comply with the standards of this policy. Revisions to written works can or will be made based upon staff resources and time available to do such revisions.*

*Advertisements / Exhibits*

*ACSM will review advertisements and exhibit displays at national meetings to assure they represent the professional image of the industry. Material that is sexually suggestive will not be accepted.*

*In order to uphold the integrity of their products or business, the association recommends that suppliers use discretion when sending or giving members specialty advertisement items. Calendars and posters that are sexually suggestive offend both male and female members and reflect negatively on the reputation of the supplier.*

*It is understood that the enforcement of this policy is to apply only to the organizational structure of ACSM. By initiating and implementing this policy, ACSM hopes to set examples*

*that will be followed for the entire surveying and mapping community, thus creating a more professional environment, free of sexual bias.*

When the guidelines for language and advertising were first adopted in the mid-1980s, a backlash occurred. In the spring of 1987, a new round of sexist advertising appeared on the ACSM exhibit floor, featuring crude imagery such as women sitting on bales of hay and cradling range poles in sexually suggestive positions. Although the new ACSM exhibit requirements clearly prohibited such forms of advertisement, the exhibits were allowed to remain. Later that year, women who had objected to the exhibits were expelled by NSPS from Forum activity. Thus began a five-year period in which NSPS restricted the composition and activity of the Forum. Surprisingly, progress continued even during this period. Most forms of sexist advertising continued to disappear, as did most forms of discriminatory language in professional and trade journals. Furthermore, the Forum was allowed to conduct special conference sessions for women and other traditionally under-represented persons. As a consequence, a growing network of women and minority groups began to communicate with one another outside the realm of NSPS and ACSM.

Examples of those workshops and conference sessions are as follows:

*(1) Equal Employment Opportunity (Reno, Nevada, 1987);*
*(2) Barriers to Professional Advancement (Cleveland, Ohio, 1989);*
*(3) The National Symposium on Women in Surveying (Denver, Colorado, 1990);*
*(4) Strategies for Success (Baltimore, Maryland, 1991);*
*(5) Job Applications and Interviews (Albuquerque, New Mexico, 1992);*
*(6) The Evolving Business Environment (San Jose, California, 1992);*
*(7) The U.S. Equal Employment Opportunity Commission (Charlotte, North Carolina, 1995);*
*(8) Equal Opportunity at the Bureau of Land Management and in the U.S. Forest Service (Little Rock, Arkansas, 2000);*
*(9) Canada's Program on Women in Science and Engineering (Las Vegas, Nevada, 2001).*

Thus, the brief period of opposition to the Forum had resulted in only small setbacks. Through the insistence of a number of female members of NSPS, the Forum was ultimately permitted to re-group in its original format, which had been a loosely organized discussion group open to all. Its name was changed to the NSPS Forum for Equal Opportunity, a move that was intended to open the group to increasing representation from previously under-represented persons in the surveying and mapping community. Under the current direction of Gail Oliver (Florida), the Forum established a large coalition of American surveyors to update ACSM's career brochure, a document that promotes the positioning industry to prospective university students. The Forum has most recently begun a re-evaluation of its purpose for the twenty-first century; a top priority will be the maintenance of the Forum's network via e-mail and Internet discussion groups.

## 3. PARALLEL DEVELOPMENTS

During the Forum's twenty-year history, similar and equally positive strides were taken in the United States and abroad, with the combined effect of producing worldwide efforts to

include women in surveying and mapping science. In the mid-1980s, the International Federation of Surveyors (FIG) announced sessions concerning the role of women in surveying, and FIG called for papers on that subject (Straight, 1988). In 1989, the International Cartographic Association (ICA) authorized a task force headed by Eva Siekierska (Canada) and Edel Lundemo (Norway) to examine the role of women in ICA (Schweik, 1993). Their report contained observations and recommendations for ICA to include more women in its ranks. Meetings of the ICA task force also set the stage for the later development of a similar task force in FIG.

During the same time period, several nations conducted their own studies on the role of women in the surveying and mapping professions. Some of those reports were compiled under the auspices of government agencies, while others were compiled by private industry or by professional associations. For example, in 1989, the American Library Association published Mary McMichael Ritzlin's (United States) examination of women's contributions to North American cartography (Ritzlin, 1989). In 1991, Clara Greed (Great Britain) published a book examining the status of women in surveying and mapping in her own country (Greed, 1991).

In 1987, men and women concerned about the plight of the Forum banded together to produce the bimonthly newsletter *Progress and Perspectives: an Affirmative Action for Surveying and Mapping*. This newsletter appeared in print until 2000, when it became an e-mail publication. It is now free of charge, to be downloaded and printed by subscribers themselves. Its archives are available in the Map Division of the New York Public Library. In 1992, Alice Rechlin (United States) analyzed the role of women in the Association of American Geographers (AAG) (Rechlin, 1992). That same year, under the presidency of Robert Foster, ACSM authorized the aforementioned Boynton study to assess the percentages of women and other underrepresented persons in ACSM membership. Later that year, the United Nations launched a study of the international participation of women in the mapping professions (Straight, 1992).

Also over the past twenty years, female surveyors in the United States have become extremely active in their state and regional surveyors' associations. In fact, soft data would indicate that the professional society participation rate of female surveyors is generally higher than that of male surveyors. In other words, a larger percentage of female surveyors than male surveyors appear to exhibit the tendency to participate in their professional organizations. By 1996, for example, ACSM members Alberta Auringer Wood, Patricia Caldwell, Wendy Lathrop, and other women had already held presidential offices in ACSM or its member organizations. Michaeline Mulvey, Susan Jensen, Patricia Hutchison, and others had already held the office of president in their respective state societies. Maggie Weidener, Linda Duffy, Joanne Crum, and others had already held positions on their respective state licensing boards for surveying.

It is also interesting to note the accomplishments of some of the earliest leaders of the Forum. Mary Feindt (Michigan) has served ACSM for over fifteen years on its standards committee. For many reasons, she is considered by American female surveyors to be their leader. She was the first chair of the Forum, and she has numerous scholarships named in her honor

through ACSM, through her state association, through university programs, and through the American Land Title Association. Feindt has been in practice for over fifty years. She is the great grand-niece of nineteenth century astronomer Maria Mitchell, and as a girl, Feindt heard family stories about this famous scientist. In 1999, Feindt herself became the recipient of an honorary doctoral degree from Ferris State University in Michigan, the same school from which her granddaughter received a degree in surveying engineering the following year. The second chair for the Forum was Loyce Smith (Idaho), who is now the Executive Director of the professional land surveyors' association in her state. The third chair, Jocelyn Martin (Maryland) began her career with the National Geodetic Survey and moved up from there to become an equal opportunity expert for the Department of Commerce. Kelly Olin, who developed the first career brochure for the Forum, has been serving ACSM for many years as the chair of its awards committee. She now leads the California State Lands Commission. On behalf of ACSM, she recently completed training as an evaluator of university programs for ABET, the national accreditation body for engineering, technology, and computer science.

Likewise, while female surveyors were gaining positions of authority in the workplace and in their professional associations, many women also joined together to form state and regional discussion groups. Examples of such groups existed in Florida, Colorado, Texas, and Connecticut. Across the border in North America, a similar group was formed in Ontario, Canada. The Canadian government has also been involved in affirmative action through the Women in Science and Engineering recruitment program. Most notable for surveyors was the fact that Elizabeth Cannon of the Geomatics [Surveying] Engineering Department of the University of Calgary chaired the Prairie Region branch of Canada's national recruitment initiative for five years. During her tenure, Cannon conducted a number of research projects to determine how and why women chose or rejected engineering programs as their field of study. The results of her research produced a number of recommended aids to the recruitment and retention of women in the engineering fields, including geomatics.

## 4. OBSERVATIONS AND RECOMMENDATIONS

The overall acceptance of women in the American surveying profession has been increasingly positive. There is more work to be done nonetheless. Six years ago, the forerunner to this paper was presented to the Advisory Committee of the Commission Officers at the 63rd Permanent Committee meeting of FIG in Buenos Aires. During that presentation, Robert Foster and this writer suggested that the surveying and mapping community must strongly compete with other science and technology disciplines for talented female members of the workforce. That recommendation still holds today. In America, for example, it has been difficult for university surveying programs to compete with engineering programs for high quality students. In order to appear more attractive to prospective students, some surveying programs have changed their names to geomatics or to similar sounding terms; other programs have become re-accredited as surveying engineering programs, also to appear more attractive to bright, young people (Onsrud, 1993). Simultaneously, the surveying profession has been opening its doors to women, to widen the pool of prospective students, and to diversify the workplace.

The concept of the Forum for Women in Surveying celebrates its twentieth birthday this year. Since the inception of that group, several female surveyors have worked continuously, in spite of all odds, to make the American professional environment more attractive for women in surveying and mapping. Thanks to their efforts, women are now in the mainstream of the American surveying community. Though their numbers are still small, their impact is significant. Through their joint efforts with the international surveying community, the impact of American women in surveying may have a positive effect in the global improvement of women's rights to land. To this end, the Forum for Women in Surveying has supported the FIG Task Force on Under-Represented Groups in Surveying.

There is more work to be done in the United States as well. Government affirmative action programs have been challenged in American courts for the past fifteen years. Opponents of public equal-opportunity efforts have succeeded in some cases, proving that reverse discrimination can occur. Examples have been contract arrangements for publically funded projects in which portions of the contract were once set aside specifically for female or minority contractors. In order for set-asides to be considered legal, women and minorities must now prove that discrimination is prevalent. Therefore, with government sponsored equal-opportunity programs under fire, it is critical for surveyors themselves to improve and upgrade their industry by opening it to all segments of the population.

The American surveying and mapping community has occasionally missed its opportunity to recruit talented women into its ranks. As the president of ACSM a decade ago, Robert Foster attempted to correct that problem. He challenged the American surveying community to ask itself some difficult questions. "Who are we? How many women and minorities are there in our field? Where did they come from and how did they happen to choose these occupations? What about our schools? Are women and other under-represented persons finding their way into them? Once they do, are these people subject to the same academic requirements and social treatment as the rest of us? Do they enjoy the same academic success as mainline students who have historically entered out professions? Once their schooling is done, do their careers progress at the same rate?" Cannon's research in Canada has resolved many of these questions for her own country, but in America, many such queries remain unanswered. As the Forum for Women in Surveying looks toward the next generation to carry on its work, let us hope that similar issues will continue to be addressed, and that equitable solutions will continue to be found.

## REFERENCES


Boynton, Nancy, et al. 1992. "ACSM Explores Equal Opportunity." *ACSM Bulletin*. No. 138, July-August 1992, pp. 39-41.

Foster, Robert W. 1994. "Surveying Education: What's in a Name?" *Civil Engineering News*. March 1994, p. 34.

Foster, Robert W. 1995. "Looking Back…Again." *Civil Engineering News*. January 1995, p. 46.

Foster, Robert W. 1995. "The Profession Looks Ahead." *Civil Engineering News*. July 1995, p. 38.

Greed, Clara. 1991. *Surveying Sisters: Women in a Traditional Male Profession*. London and New York: Routledge.

Knutson, Aasa. 1995. "Female Surveyors in Sweden." *Progress and Perspectives: An Affirmative Action for Surveying and Mapping*. May-June 1995, p. 3.

Lundemo, E. and M.B. Nordii, 1990. "Longterm Recruitment and Personnel Planning Policies." *XVIX Congress FIG Commission 1*. 1990, pp. 107-112.

Onsrud, Harlan J. and Jeffrey K. Pinto. 1993. "Surveying and Comparative Analysis of Alternative Names for an Academic Discipline." *Surveying and Land Information Systems*. Vol. 53, No. 3, September 1993, pp. 164-178.

Pinkerton, Jerry L. 1991. "The Co-Operative Education Program and Women Surveyors in Alaska." *Surveying and Land Information Systems*. Vol. 51, No. 4, December 1991, pp. 272-276.

Rechlin, Alice T.M. 1992. "Women's Places in the Profession of Geography." *Progress and Perspectives: Affirmative Action in Surveying and Mapping*. May-June 1992, p. 4. and July-August 1992, p. 1.

Ritzlin, Mary McMichael. 1989. "Women's Contributions to North American Cartography." *Meridan.* No. 2, 1989, pp. 5-16.

Scullen, Wendy J. 1990. "Women In Surveying in Australia: The Road Ahead." *XVIX Congress FI G Commission 1*. 1990, pp. 87-95.

Schweik, Joanne L. 1993. "Women In Cartography: A Report." *Progress and Perspectives*: *Affirmative Action in Surveying and Mapping*. September-October 1993, p. 5.

Schweik, Joanne L. 1994. "Toward Success and Satisfaction in Surveying Careers." *Progress and Perspectives: An Affirmative Action in Surveying and Mapping*. May-June 1994, p. 3.

Siekierska, Eva, et al. 1991. "The Participation of Women in the International Cartographic Association." *Special Report to ICA.* 1991.

Straight, Wendy J.W., Ed. 1992. "1991 was a Good Year: The Engineering Profession Examines The Status of Women." *Progress and Perspectives: Affirmative Action in Surveying and Mapping*. January-February 1992, p. 7.

Straight, Wendy J.W., Ed. 1992. "Women on the Frontier." *Progress and Perspectives*: *Affirmative Action in Surveying and Mapping*. May-June 1992, p. 4.

Straight, Wendy J.Woodbury. 1993. "But what Can I Do: Ten Simple Steps to Help Achieve Equal Opportunity in Surveying and Mapping." *ACSM Bulletin.* Vol. 144,

July-August 1993, pp. 35-37.

Straight, Wendy J. Woodbury. 1995. "Breaking the Gender Barrier: A Decade of Affirmative Action in ACSM." *Civil Engineering News*. March 1995, pp. 32-34.

## BIOGRAPHICAL NOTES

### Wendy J. Woodbury Straight

Licensed as a professional land surveying in New York state and in Pennsylvania, the author has been the owner and operator of Woodbury Surveying and Geomatics in Dunkirk, New York since 1983. She is a member of the American Congress on Surveying and Mapping, the New York Association of Professional Land Surveyors, and the Pennsylvania Land Surveyors Association. She also belongs to the Niagara Frontier [Regional] Land Surveyors Association and the Allegheny Plateau [Regional] Surveyors Association. Straight is a past

chair of the Forum for Women in Surveying and is the editor of *Progress and Perspectives: an Affirmative Action for Surveying and Mapping*. She recently completed a five-year contract as the surveying columnist for *CE News* magazine. Straight has been an ABET university program evaluator since 1994, and in 2001, she began a term of service on the Applied Science Accreditation Commission for ABET.