



# AFS Roots: Emmeline Moore, All Things to All Fishes

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Illustration by Lauren Zatkos

## INTRODUCTION

As we reflect on the rich history of the American Fisheries Society (AFS), no greater inspiration emerges than the pioneering figure of our 47th President, Emmeline Moore (Figure 1). In addition to serving as AFS's first female President, her groundbreaking research in the fields of aquatic ecology, fish health, and watershed-based ecosystems irrevocably shaped fisheries research and management. She led the fisheries bureau of the New York State Conservation Department (NYSCD), reminiscing "I had to be all things to all fishes" (Scott 1961). Moore was similarly broad in her service to AFS, as is demonstrated by her participation in more than a dozen diverse committees throughout her tenure with AFS, providing consistent high-level expertise, synthesis, and leadership (Figures 1 and 2). From award-winning presentations to regular donations to Society funds, her legacy reveals a mixture of brilliance, talent, and dedication to fisheries and to AFS. With over 25 first-author publications, Moore broke boundaries as the first woman to publish in *Transactions of the American Fisheries Society* (TAFS), and later the first woman in the United States to publish a paper on fish diseases (Mitchell 2001). Moore not only strengthened the Society, but fisheries science as a whole.

Moore had an incredible dedication to science and fisheries management. Though she began her career as a biology teacher and enrolled at Cornell University with a focus on botany, she concluded her PhD work on pondweed (*Potamogeton* spp.) with an invested interest in aquatic ecology and fishes (Figures 1 and 2). She remained unmarried and focused her efforts on teaching and research. This is especially important given that, historically, wives or mothers who aspired to conduct fisheries research were frequently restricted to volunteer work with their husbands' permission (Brown 1994). Moore's groundbreaking studies represent some of the earliest examples of ecosystem science and landscape ecology, and changed the way New York state fisheries management operated. As the first woman scientist employed by the NYSCD, she developed and directed two of the largest ecosystem-wide investigations into the biology and fish dynamics of Lake George, and later of each watershed throughout the entire state (Hennigan 2004). It was during these state-wide watershed studies that Moore was elected the first female President of AFS. During these extensive projects, she was also promoted to Chief Aquatic Biologist at the NYSCD. She was a pioneer as the first and, to date, the only woman to hold this position.

Her legacy today continues to be honored by AFS through the annual Emmeline Moore Prize (see "Involvement with AFS" section below). In addition, she was memorialized by the NYSCD's 40-foot marine research vessel dubbed the *Emmeline-M* (Figure 1), in the naming of the Emmeline Moore Research Library (soon to be dedicated by the NYSCD), and in AFS publications and retrospectives (Miller 1957; Carlander 1984; Moffitt 2001).

During the AFS 150th anniversary, it is especially important to acknowledge and show appreciation for those individuals who dedicated their careers to improving fisheries science and shaping the community of our Society. Without their efforts, we may not have arrived at this historic milestone. On this auspicious occasion, we further remember Emmeline Moore by highlighting some of her many accomplishments. Indeed, Moore was a multi-faceted pioneer in fisheries science. Her presence resulted in a more rigorous and diverse outlook on fisheries management and aquatic science and her efforts increased membership and participation in AFS.

## EARLY LIFE

Emmeline Moore was born in Batavia, New York in 1872, 2 years after the formation of AFS (then the American Fish Culturists' Association). She was the fifth of nine children, with her mother emigrating to the USA from Germany and her father from Switzerland (U.S. Census Bureau 1880). The Moore farm, where Emmeline was raised, lay near a swampy area along a tributary of Tonawanda Creek. Growing up in this area played an important role in Moore's keen interest in natural science and curiosity (Balon et al. 1994). She later recalled, "I used to go to the swamps every Sunday. I remember seeing my first cardinal flowers and ferns there" (Brown 1994). Like many other women with interests in science at the time, Moore began teaching after her graduation from Geneseo Normal School in 1895 (Ogilvie and Harvey 2000).

## PRE-FISHERIES TEACHING

Though Moore did not start her professional work in fisheries, she showed the great dedication and enthusiasm for scientific inquiry that characterized her career throughout her lifetime (Figure 1). Starting in 1895, she spent 7 years in Scottsville, Cattaraugus, and Cooperstown, New York as a teacher. After receiving her BA and MA, Moore served as an instructor of biology at Trenton Normal School for 5 years (Figure 2). She was known to hold children's attention with her inventive lessons, employing creative learning strategies to teach beyond memorization (see "Science Communication" section below). For example, she had students recognize cleanliness issues in their book covers, hands, fingernails, splinters from the floor, and even paper money by using agar plates to grow cultures from these surfaces. She then submitted these cultures to the State Bacteriologist for identification, who noted that "most of the cultures were the common pus forming variety" (John Hopkins University 1910). With these experiments, she highlighted that "the demonstrations served their purpose in not only emphasizing and giving force to the discussions on this subject, but in introducing into the discussions an element of reality, and of tangibility," (John Hopkins University 1910).

Moore's short essay titled "A Survey of Nature Study in New Jersey" posited the necessity of biology teachers having the right attitude and the appropriate training to effectively teach young potential scientists (Moore 1908). In 1911, Moore took her teaching abroad to the Huguenot College for Women in Wellington, South Africa as an exchange professor of botany (New York Times 1963; Brown 1994), after which she completed her PhD at Cornell University (Box 1). After earning her PhD, Moore was employed at Vassar College from 1914–1919. She began as an instructor, but was then promoted to assistant professor of botany, her final non-fisheries position (Brown 1994). There, Moore's leadership abilities were revealed as she led her botany class in collaboration with students of English, led by Winifred Smith, in the development of Vassar's Shakespeare Garden (Lengen and Reilly 2004). The project involved faculty and students working together as a collaborative research project to arrange a garden that featured plants and flowers found in Shakespeare's hometown of Stratford-upon-Avon (Vassar Historian n.d.).

## PERSONAL LIFE

Most of what is known about Moore's personality and personal life comes from her professional life. She never married, remained close to several of her siblings, and lived with

## Notable milestones

1872: Born in Batavia, New York  
 1895: Graduated from Genesco Normal School<sup>1</sup>  
 1895-1902: School teacher (Scottsville, Cattaraugus, & Cooperstown)<sup>1</sup>

1905: A.B. Cornell  
 1906: A.M. Wellesley  
 1906-1910: Instructor at New Jersey State Normal School at Trenton  
 1911: Exchange Professor at Huguenot College for Women in Wellington, South Africa  
 1914: Obtained her PhD from Cornell University, NY<sup>2</sup>  
 1914-1919: Instructor / Assistant Professor at Vassar College  
 1915: Walker Prize for her essay "*The Potamogetons in Relation to Pond Culture*"<sup>3</sup>  
 1916: Designed and built the first Shakespeare Garden at Vassar with Winifred Smith and their respective students<sup>4</sup>  
 1917-1919: Worked on Federal World War I project - food relations of fish<sup>1</sup>  
 1919: Honorary Fellow at the University of Wisconsin

## 1870-1900

## AFS and other accomplishments

1870: AFS is established as the American Fish Culturists' Association  
 1872: First issue of TAFS is published

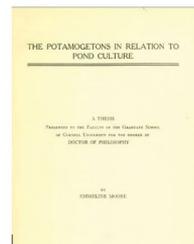
## 1900-1920



Photo: At the Shakespeare Garden



Photo: Emmeline Moore



1918: Joined AFS<sup>5</sup>  
 1919: Presented "*Plants That Are of Importance in Ponds*" at the 49th AFS annual meeting; "*Plants of Importance in Pond Fish Culture*" is the first article led by a woman in TAFS<sup>9</sup>

## 1920-1940

1920-1925: First woman scientist employed by New York State Conservation Department, worked as an investigator in fish culture<sup>3</sup> and led extensive research on fish communities in Lake George<sup>2</sup>  
 1924: Gave a radio interview on WHAZ, the station on the Rensselaer Polytechnic Institute, about the artificial propagation and distribution of fish in NY  
 1926-1939: Led the New York State Biological Survey, the most comprehensive watershed study of aquatic resources at that time<sup>5</sup>  
 1932: Gave a radio talk about eels<sup>6</sup>  
 1932-1944: Chief Aquatic Biologist for New York state<sup>5</sup>  
 1939: Honorary Doctorate from Hobart College, Geneva, New York<sup>1</sup>

1922: Best contribution on biological investigations applied to fish-cultural problems "*Octomitus Salmonis, a New Species of Intestinal Parasite in Trout*," at the 52nd Annual Meeting of AFS<sup>10</sup>  
 1922: Published a stream pollution study for the NYSCD  
 1923: First woman in the U.S. to publish a paper on fish health "*Octomitus Salmonis, A New Species of Intestinal Parasite in Trout*" in TAFS<sup>11</sup>  
 1923: Appointed AFS Vice-President of the Division of Aquatic Biology and Physics<sup>12</sup>  
 1924: Appointed AFS Vice-President of the Division of Fish Culture<sup>13</sup>  
 1925: Elected Chair of the AFS Executive Committee for 1926<sup>14</sup>  
 1926: Elected Vice-President of AFS<sup>14</sup>  
 1927: Served as first female president of AFS<sup>15</sup>  
 1929: Appointed Chair of the AFS Resolutions Committee and to the AFS Program and International Relations Committees  
 1930: Appointed to AFS Nominations Committee  
 1931: Appointed to AFS Resolutions Committee, Elected officer of AFS Relations with Foreign and State Governments  
 1932: Appointed to 62nd Annual AFS Program Committee  
 Appointed to make recommendations for the use of income from the Permanent Fund (i.e., to abstract foreign research dealing with fish culture publishing as an appendix to TAFS)  
 1934: Appointed to the AFS Time and Place Committee  
 1936: Appointed to AFS Nominations Committee



Photo: AFS annual meeting in Toronto (1930)

## 1940-1960

1944: Retired from the NYSCD at the age of 72<sup>7</sup>  
 1944-1945: Research Associate with the Bingham Oceanographic Laboratory at Yale University  
 1956: New York state research vessel named The Emmeline M<sup>1</sup>

1940: Chair of AFS Committee on Time and Place  
 1941: Appointed to AFS Special Committee on Pollution Study

## 1960-2010

1963: Moore passes away at the age of 91 on September 13th

2009: AFS Emmeline Moore Prize initiated annually to recognize a member for lifetime achievements in the promotion of demographic diversity in the society<sup>16</sup>



Photo: Equal Opportunitites Section (AFS)

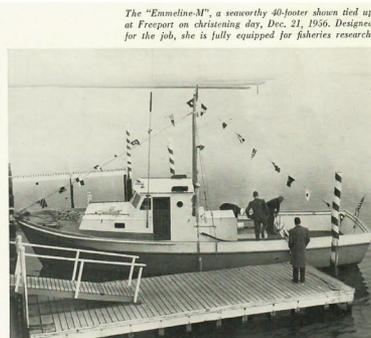


Photo: The "Emmeline-M" research vessel (1956)

### Dr. Emmeline Moore to Retire

Special to THE NEW YORK TIMES.

ALBANY, March 28—Dr. Emmeline Moore, pioneer in fish culture research and the only woman ever elected president of the American Fisheries Association, will retire Friday after twenty-five years of service with the Conservation Department.

The New York Times  
 Published: March 29, 1944  
 Copyright © The New York Times



Photo: At her desk (1963)

Figure 1. Timeline of major milestones in the life of Emmeline Moore. <sup>1</sup>Balon et al. (1994), <sup>2</sup>Langenheim (1996), <sup>3</sup>Boston Society of Natural History (1915), <sup>4</sup>Lengen and Reilly (2004), <sup>5</sup>Moffitt (2001), <sup>6</sup><https://vimeo.com/421198266> <sup>7</sup>Daniels (2011), <sup>8</sup>TAFS (1919), <sup>9</sup>TAFS (1920), <sup>10</sup>TAFS (1923), <sup>11</sup>Mitchell. (2001), <sup>12</sup>TAFS (1924), <sup>13</sup>TAFS (1925), <sup>14</sup>TAFS (1926), <sup>15</sup>TAFS (1927), <sup>16</sup>Franzin and Alade (2009).

her widowed sister Frances in Slingerlands, New York, upon retiring. Her friendships appear to have been dominated by colleagues from her graduate studies and work (e.g., Hortense

Butler Heywood, with whom she corresponded about her first AFS meeting experiences; available: <https://bit.ly/3jk7tYJ>). Moore was considered supremely qualified in freshwater

## Box 1 Women's Suffrage Movement

### Women's Suffrage

Although we found no direct connections between Emmeline Moore and leaders of the Women's Suffrage Movement, Moore attended Cornell University during peak years of the suffrage movement, where visible suffrage leaders and activity surrounded her intellectual development. Women's education was supported with full access provided to all programs from the time of Cornell University's founding. Cornell women formed a network of connections within institutions of higher education in the region. Immediately following her undergraduate degree from Cornell University, Emmeline Moore took the opportunity to join Wellesley College as a graduate fellow working on a Master's program in 1905 to 1906. During those years, the Seven Sisters Colleges (Wellesley, Barnard, Bryn Mawr, Mount Holyoke, Radcliffe, Smith, and Vassar) provided many opportunities for networking and engagement for women, and several colleges, particularly Wellesley, Mount Holyoke, and Smith College provided graduate opportunities with teaching fellowships within the sciences. At Wellesley, Emmeline worked alongside Margaret Clay Ferguson, who had received her PhD from Cornell and who would later become the first female president of the Botanical Society of America, in 1929. Moore's master's thesis "The Study of Winter Buds with Reference to Their Growth and Leaf Content" was published in the *Bulletin of the Torrey Botanical Club* in 1909. Her publication was awarded the second prize by the Boston Society of Natural History in the Walker Prize Competition for 1908. She then won the Walker Prize again in 1915 for "The Potamogetons in Relation to Pond Culture" (Boston Society of Natural History 1915). After Moore completed her PhD at Cornell, another opportunity to engage with faculty within the Seven Sisters Colleges came with her appointment at Vassar College from 1914 to 1919. During this time, Vassar's chapter of the Equal Suffrage League was the first to establish a "Woman's Suffrage School," in which student debaters and speakers were systematically trained to be suffrage officers. Although we found no documented direct connection during this time, Inez Milholland (the famous suffrage leader that rode the white horse into Washington, D.C. in 1913) was a Vassar graduate, along with many others from Vassar that were active in the movement. Nearby, New York City was the headquarters of the national anti-suffragist movement, and the state of New York passed the woman suffrage referendum in November 1917.

ecology, made important ecological connections in aquatic ecosystems, and quickly gained professional recognition (Van Put 2007). She used her position to develop strong relationships between universities and colleges by hiring and encouraging many young scientists and experts (Balon et al. 1994). While Moore's colleagues did not see her work frequently in the field, as she assumed managerial duties, she was known to be able to coordinate the surveys in totality (Figure 2). Her ability to influence a wide audience, from legislators to undergraduates, allowed her to manage all aspects of the surveys from funding to publication (Daniels 2011). Those who worked with Moore described her as "having awesome dignity" (Van Put 2007), "a quieter lady with great understanding," and as an "effective and no-nonsense manager" (Daniels 2011). Moore ruled "with an iron hand over probably the biggest fisheries survey ever conducted in North America" (Norton 2002). It is unquestionable that Moore's drive, passion, and personal qualities allowed her to leave a lasting legacy anywhere she was involved.

### FISHERIES CAREER

Moore had an exceptional career, characterized by its extension in time, topics, peer recognition, and the cataloguing of "more than 400 varieties of fish in New York waters" (New York Times 1963). Through her position in educational and research institutions and her public service in the NYSCD, Moore made substantial contributions to higher education,

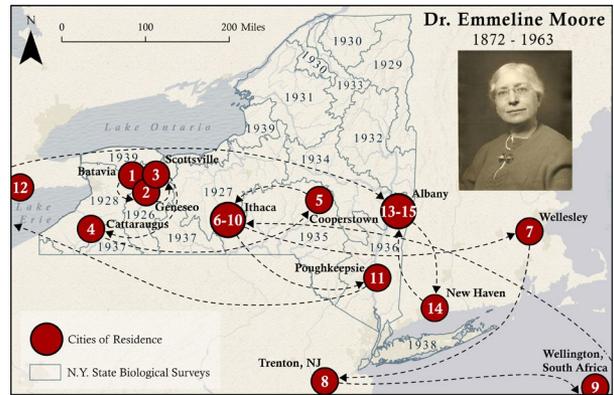


Figure 2. Map of Emmeline Moore's cities of residence overlaid on the New York State watershed surveys. Dates of each survey are within each respective outline. (Service layers by ESRI and USGS).

conservation, and management. However, most of all we can say she had a prevailing influence on our modern thinking of freshwater ecology. Moore transitioned through varied topics in aquatic ecology, touching on botany, ichthyology, limnology, parasitology, and bacteriology among others, while always reaching a high degree of detail (Figure 1). From our literature review, we can attribute Moore's professional success to her outstanding dedication, scientific rigor, education, collaborative network, ability to communicate, and a professional disposition that she strictly maintained throughout her career.

I would like to see developed a course in biology in which there is less tendency to rely on efficacy of information only... it produces knowledge static instead of knowledge dynamic.

—Emmeline Moore (extracted from Proceedings of the Annual Convention of the Association of Colleges and Preparatory Schools in the Middle States and Maryland; Moore 1911)

### World War I Project

During her teaching employment at Vassar College, Moore was involved in additional work that impacted the trajectory of her career (Figure 1). From 1917 to 1919, she spent her summers working with the U.S. Bureau of Fisheries at several locations, including the Biological Station at Fairport, Iowa, and focused her attention on the importance of plants in fish culture (Ogilvie and Harvey 2000; Pritchard 2005). Moore was outspoken in her teaching career and came to the fisheries field with considerable professional experience at the age of 47, when she was hired for this position with the U.S. Bureau of Fisheries. It was also during this pivotal time when she solidified her interest in pursuing a career in research (Ogilvie and Harvey 2000). In 1920, the publication of her findings, "Some Plants of Importance in Pondfish Culture," was officially printed in the U.S. Commissioner of Fisheries annual report (U.S. Bureau of Fisheries 1920). This report was part of a national initiative to accelerate research in commercial fisheries and was considered especially important during a time of World War I-associated food shortages (Hobart and Service 1995). This wartime publication would also later be identified by Moore as a notable moment in her career. Shortly after,

she left the project at the Fairport Iowa Biological Station and her role as an instructor at Vassar College to assume a position as the first professional investigator of fish culture for the New York State Conservation Department and become the first female scientist hired by department (Balon et al. 1994; Brown 1994).

#### Lake George Surveys with the NYSCD

Some of the most acknowledged contributions of Moore to fish ecology was her work with the NYSCD and, more specifically, her leading role in the biological investigation of Lake George and the New York State (NYS) Biological Survey. These surveys were spatially extensive, multi-year projects where many aspects of freshwater ecology were comprehensively collected. For many, they remain acknowledged as some of the most comprehensive biological surveys ever made in the United States (Balon et al. 1994; Moffitt 2001; Daniels 2011).

The history of the NYS survey began with the groundwork of John S. Titcomb, former President of AFS (1899–1900), and one-time State Fish Culturist in the NYSCD. As Moore returned from the Midwest, Titcomb hired her as a Special Investigator in Fish Culture, making her the first woman scientist in the history of NYSCD. Between June and September 1920, Moore worked as the lead botanist of the Lake George Study in the exhaustive collection of biological and water chemistry data to provide evidence supporting hypotheses on the detrimental effects of indiscriminate stocking (Titcomb

1922). As part of these studies, Moore participated in the development and implementation of a comprehensive survey of all watersheds draining to the lake (Needham 1921).

The Lake George surveys foreshadowed the transition of Moore to lead investigator of the NYS Biological Survey, where she promoted a focus on fish productivity and freshwater habitats in response to the state's agenda on fish-stocking, as well as other emerging environmental problems associated with hydroelectric impoundments, construction of canals, and pollution of municipal water supplies (Moore 1927). Moore recognized a knowledge gap in the basic ecology of fish populations, and recognized that these issues could only be addressed with the "greater continuity and comprehensiveness" of whole watershed studies (Moore 1927).

#### New York State Biological Surveys with the NYSCD

Every summer between 1926 and 1939, Moore prepared, organized, trained, and supervised field crews for the surveying of 17 watershed units across the state of New York (Figure 3; Daniels 2011). In its first year, she assembled a team of aquatic biologists as part of a crew totaling 13 people (Daniels 2011). After reporting on the results of the first survey, funding and collaboration rapidly escalated over time, and personnel increased to crews between 30 and 40 people (Carlander 1984).

In total, four other participating fisheries scientists in these watershed surveys had or would serve as AFS Presidents, including John S. Titcomb (1899–1900), George C. Embody



**Figure 3.** In this undated photo from the New York State Conservation Department, Moore inspects a field encampment of the biosurvey team. As the surveys progressed, she secured and oversaw laboratories borrowed from local schools and gave lectures in the local communities about the surveys and their findings.





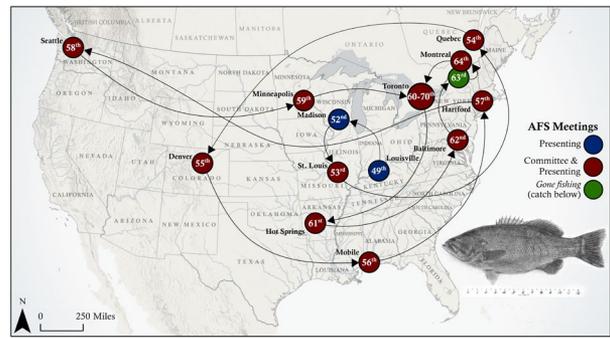
**Figure 7.** Scan the QR code to hear Emmeline Moore discuss the importance of scientific communication in a New York radio interview. [Links to Vimeo, posted by the American Fisheries Society (<https://vimeo.com/421198266>)].

extraordinary ecologist representing a non-traditional ecological background (Langenheim 1996).

Moore was known as one of the first American fish pathologists (Snieszko 1975) and discovered the intestinal parasite *Octomitus salmonis* in trout, which was responsible for a fish disease observed in hatcheries (Moore 1923b). In addition to a presentation at AFS, she presented her work on the parasite at the American Association for the Advancement of Science meeting in Cincinnati, Ohio (Knuth 2000). Her research extended to stream pollution, resulting in several articles on this topic (Suter and Moore 1922; Moore 1932, 1937). Moore continued to author scientific articles throughout her life, in addition to the comprehensive watershed reports she compiled for New York, “described as the most comprehensive scientific examination of any state’s water resources ever conducted” (Hennigan 2004). Her breadth of knowledge across the topics of botany, fish management, parasitology, and pollution culminated in projects conducted from an ecosystem-based approach, including sampling non-game species and investigating aquatic food webs. This was novel in early 20th century fisheries science and resulted in highly effective management recommendations that are still relevant today.

### SCIENCE COMMUNICATION

Communicating science was quite important to Moore, and she regularly gave radio interviews and conducted public seminars (Figure 1). With a background in teaching (both K–12 and university-level) and a PhD in science, she was ahead of her time in understanding the value of public outreach. In one of her papers on stream pollution (1932), she writes “It is our opportunity to break away from the old tradition and to help create a better public sentiment.” Listening to her radio interviews and reading coverage of her stories in the *New York Times* from the 1920s and 1930s, one can clearly understand her ability to discern facts that are worth communicating to her audience, while also engaging them with her unique way of expressing ideas and stories. In her own words spoken during an interview with the *New York Times*, “The line of thought in our program is to get over to the public the idea that a research job is necessary to get facts before coming out with a recommendation for improved management of the resource” (Figure 7; AFS 2020).



**Figure 8.** Map of Emmeline Moore’s attendance at AFS Annual Meetings, including a year of flyfishing during the 64th meeting at Big Wolf Lake, New York, where she proudly caught the biggest Smallmouth Bass ever registered for the system. (Service layers by Airbus, USGS, and the GIS User Community).

In addition to interviews, Moore was also an advocate of using scientific illustrations to communicate science (Figure 4). While working as director for the NYSCD conducting watershed surveys, she published a handful of reports, which were consistently supplemented with illustrations. Her insistence to include detailed illustrations in her work is attributed to her intent to spark interest across all swaths of the public, including different classes, professions, and backgrounds (George et al. 1986). The illustrations further served as educational material for science classes because the details in the drawings were often accurate down to the number of fish scales (George et al. 1986).

### INVOLVEMENT WITH AFS

Emmeline Moore became an AFS member in 1918 and attended her first meeting in 1919, where she presented “Plants That Are of Importance in Ponds” (Figure 1). The paper was well received and Moore would continue to attend meetings throughout the next 2 decades (Figure 8). Writing about that first meeting to her friend Hortense, she exhibited her commitment to the Society by noting that she had an ulcerated tooth that was removed before the meeting “and that was quite an interruption of [her] work” (available: <https://bit.ly/3jk7tYJ>).

Moore had a diverse and far-reaching effect on AFS. Not only did she publish and edit many articles in TAFS, but her 1922 paper on the trout parasite *O. salmonis* was the first on fish health to be published by a woman in North America (Moffitt 2001). This paper also earned Moore a prize for “[the] best contribution on biological investigations applied to fish culture” at the 1922 AFS Annual Meeting in Wisconsin. As evidenced by her many publications, she traveled to and presented papers at over a dozen Society meetings held in Canada and the USA (Figure 8). In addition to sharing knowledge gained from her research, she carved out time throughout her busy professional life with the NYSCD to serve on Divisions and committees within AFS (Figure 1). She served on at least nine committees, as well as holding Vice-President positions in the Division of Aquatic Biology and Physics (1923) and Division of Fish Culture (1924), and served as Chair of the Executive Committee (1926), Vice President (1927), and first female President of AFS (1927–1928).

Reflecting on her years of AFS leadership, Moore noted “I sometimes had a hard time making my authority felt,” (Scott 1961). Although she joked upon her succession to the presidency, that

### Box 2 The AFS Emmeline Moore Prize.

The AFS Emmeline Moore Prize is a career achievement award recognizing an individual AFS member promoting demographic diversity in the Society by demonstrating strong commitment and service to: ensuring equal opportunity access, diversity initiatives, leadership, public understanding, and under-represented groups. The prize is awarded annually. Recipients of the Emmeline Moore Prize to date include: Bradford E. Brown (2009), Christine Moffitt (2010), Ambrose Jearld, Jr. (2011), Hiram W. Li (2012), Steve E. Lochmann (2013), Gwen White (2014), Dionne Hoskins (2015), Mamie Parker (2016), Hannibal Bolton (2017), Julie Claussen (2018), Kenneth Beal (2019), and Ivan Arismendi (2020).

the honor is great because sixty years ago, or about that, when the Society was organized, the membership was so broad in their views that they did not regard it necessary to make special provision for untried presidential femininity. In the years that have elapsed it has not been necessary to make any other rule, so that today my nomination went through without the necessity of changing the rules.

(Proceedings of the American Fisheries Society 1927)

It would be more than 50 years before another woman would serve as AFS President.

As a life-long member, Moore dedicated much of her valuable time to the growth and wellbeing of AFS. She recommended individuals for membership to the Society, with her recommendations accounting for the most new members at the 59th AFS Annual Meeting. She also regularly donated extra funds, including in years when she did not attend conferences (e.g., 1921). In later years, her annual donations were often one-fifth of the cost of a lifetime membership to the Society (Proceedings of the American Fisheries Society 1928). In Baltimore, Maryland, when tasked with recommending the use of income from the Permanent Fund, she suggested abstracting foreign research on fish culture to be published as an appendix to TAFS in 1932. Her promotions undoubtedly increased the recognition and reputation of AFS. Her legacy is honored by the Emmeline Moore Prize, awarded to individuals who dedicated their careers to promoting demographic diversity in the field and within the Society itself (Box 2). Awardees also must show successful initiatives to increase the availability of education to diverse students, as well as exemplary leadership similar to the Prize's namesake.

### CONCLUSION

As a pioneer in both the worlds of fisheries and of women in science, Emmeline Moore contributed tremendously by permanently changing the paradigm of fish management to include a broader ecosystem-scale perspective. Her interest and devotion to the natural sciences formed early in her childhood and led her to obtain multiple degrees; that alone was uncommon for women in the early 20th century. Her ability to educate and lead further contributed to her wide-ranging influence, both geographically and scientifically. Teaching at multiple schools in the United States and a year in South Africa (Figure 8), she emphasized collaboration with graduate students and professionals to bring wide-ranging expertise to her projects. This collaborative spirit notably played a role in the success and extent of her studies.

Moore made history repeatedly, by becoming the first woman to accomplish a number of achievements including publishing in TAFS, serving as AFS Vice President and President,

publishing on fish diseases in the USA, working as a scientist for the NYSCD, and later assuming a position of leadership at that agency. Once she focused on fisheries, she proceeded to quickly alter the way fish were managed. By taking into account not only the target fish population, but also food web dynamics, prey species, and abiotic factors such as habitat quality and anthropogenic impacts, her extensive projects in Lake George and other watersheds in the state of New York were landmark efforts in freshwater ecology. Her accomplishments are still considered remarkable today and were unprecedented in her time. She was an effective woman leader, in a vastly male-dominated field.

Moore made a lasting impression on the scientific community and society. From dedicating her limited free time to AFS to presenting findings from her dozens of published articles and contracting artists to illustrate collected specimens (Figure 4), Moore's contributions were immeasurable. She made a point not only to advance her own scientific accomplishments, but also to share her knowledge and skills through her leadership, communication, and education. Unlike many of her contemporaries, she paid female support staff (e.g., J. R. Greeley, illustrator Ellen Edmondson), for work in the field. Her uncommon service to AFS as a donor, a member of numerous committees, and as the 47th AFS President undoubtedly progressed both the culture and the expertise of AFS. Looking ahead to the future of the Society, we should keep Moore's accomplishments and dedication to demographic diversity in mind. The inspirational and pioneering work she conducted cleared a path for under-represented scientists in fisheries to lead, educate, and think outside of the box. By paying tribute to her achievements, we can continue on the path set by Emmeline Moore as we work to broaden AFS's ability to stay relevant, retain diverse scientists, and engage audiences into the future.

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#### SUPPORTING INFORMATION

Additional supplemental material may be found online in the Supporting Information section at the end of the article.

Supplement S1. List of publications and reports authored and edited by Emmeline Moore. [AFS](#)