

History and Role of the Journal *Wetlands* in Developing the Field of Wetland Science

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ABSTRACT:

Development of wetland science as a distinct field required consolidation of wetland-related publications in a recognized wetland journal. Growth of the Society of Wetland Scientists was thus tied to developing its own publication outlet. *Wetlands* debuted as the proceedings of the SWS meeting held in 1981, became a peer-reviewed proceedings in 1982, and was opened to outside submissions in 1983. Major changes in the journal through the years included gaining coverage in important abstracting services, switching to a larger page format, creating key word and author indices, developing an electronic distribution option, converting to an on-line submission process, increasing exposure, and growing larger. Manuscript submissions increased, more papers were published, and more pages were produced. The journal moved to two issues in 1988, three issues in 1989, four issues in 1993, and six issues in 2010. Growth of the journal transformed it into the top journal in wetland science, with submissions coming from around the globe. The journal is multi-disciplinary in scope, exposing readers to a variety of ideas, methods, and applications. Consolidating efforts from many fields of expertise with a focus on wetlands helped to develop a broad, ecosystem-based science that is now globally recognized.

HISTORY OF THE JOURNAL

The advancement of wetland science as a distinct field of endeavor was closely related to founding and growth of the Society of Wetland Scientists. An underlying pinion for the recognition and stature of scientific societies is support of publications with credibility in the greater scientific world. The Society of Wetland Scientists was founded in 1980 and promptly began the process of developing publications. The *SWS Bulletin* was initiated as a non-refereed publication containing news about wetlands and updates on SWS activities. It evolved to *Wetland Science and Practice* in 2009 and made a more recent transition to a refereed publication. *SWS Research Briefs* was added in 2008 as a non-technical refer-

eed outlet for short summaries of wetland research directed toward managers, policy-makers, and the general public. However, a key piece in the effort of the SWS founders to make wetland science a recognized field of its own was creation of the journal *Wetlands* – here I report its history.

The first issue of the journal was a non-refereed proceedings from the second SWS annual meeting held in Alexandria, Louisiana in 1981. Janie Harris, Paul Knutson, and Robert Soots, Jr. comprised the Editorial Board responsible for that single issue of Volume 1, which contained 18 articles and 214 pages and was printed by SWS. Volume 2 was a single issue refereed proceedings, with Robert Soots, Jr. serving as Editor and printing done by Fink's Printing and Graphics, Inc. in Gaithersburg, Maryland. *Wetlands* evolved to an open-submission refereed journal with the single issue of Volume 3 in 1983; Armando de la Cruz served as Editor, with six supporting Associate Editors and printing by Precision Press in Wilmington, North Carolina. Gene Silberhorn became editor in 1984 and produced single issue Volumes 4-7. I was indoctrinated into the journal business when Gene added me as an Associate Editor in 1984.

In 1986, Gene announced his resignation as Editor to make his successful run for SWS Vice-President (and then President). At a fateful INTECOL meeting in the Carrier Dome at Syracuse University, I had a discussion with fellow Associate Editor and then SWS President Courtney Hackney regarding future editorship. I described my vision for a quarterly journal and my goal of making *Wetlands* the number one choice for publication of the best papers related to wetlands. I volunteered to take over, and Courtney agreed. He may have taken the decision to the Board, although maybe not, as SWS activities were less controlled in those days.

In my early days as Editor-in-Chief, I sought advice and assistance from others. I increased the number of Associate Editors by adding Sandra Brown, Paul Glaser, James Grace, Curtis Richardson, Milton Weller, and Thomas Winter in a deliberate effort to cover the variety of fields of expertise in wetland science with good people. Robert Wetzel advised me that to attract good manuscripts, the journal must be covered in *Current Contents* and other abstracting services so that published papers would be seen by others

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and cited. *Current Contents* proved to be a tough battle because they required evidence that a journal is published on a regular schedule. With two on-time issues of Volume 8 in 1988, they were convinced. The journal was soon included in 24 abstracting and referral services (Table 1).

Wetland manuscripts had previously been spread among a myriad of journals, some of which are listed in Table 2. However, *Wetlands* offered potential authors the advantage that their papers would appear in the mailbox of more wetland scientists than those in any other journal. The journal grew along with the growth in SWS membership, and three issues were published in Volume 9. At the urging of then SWS Past President Mark Brinson, the journal changed to a larger page format with Volume 12 in 1992, and printing was moved to Allen Press in Lawrence, Kansas. A blue-gray cover also replaced the previous goldenrod cover. The goal of quarterly publication was reached with Volume 13 in 1993.

In 1995, I assigned a work-study student to develop a Key Word Index and Author Index for all papers published in Volumes 1-15. Those indices were published in Volume 16, No. 1, and yearly updates were included in each succeeding volume through 2006. The SWS website (<http://www.sws.org>) was created in 1996, and the journal page included listing of the Editorial Board, Instructions for Authors, Table of Contents for all past issues, Table of Contents for issues in press, and (through 2006) a searchable Key Word Index and Author Index. As a result of the ties with Allen Press, SWS became a charter member of

TABLE 1. List of abstracting and referral services covering *Wetlands* by 1989.

AESIS	Georef
Agricola	Inside Conferences
Aquaphyte	Life Sciences Collection
Aquatic Science and Fisheries Abstracts	National Wetlands Newsletter
BIOSIS	Oceanic Abstracts
CAB Abstracts	Pollution Abstracts
CAB Health	Restoration and Management Notes
Current Contents	Science Citation Index
Energy Science and Technology	Social SCISEARCH
Environline	Toxline
Environmental Bibliography	Uncover
Geobase	Water Resources Abstracts

BioOne in 1999, which made the journal available electronically in many college and university libraries beginning with Volume 20. Distribution of BioOne library subscription fees based on relative use of individual member journals resulted in fund transfers to SWS often equivalent to the costs for producing one of the four yearly issues. The BioOne process made all new issues of the journal available electronically, but it took the effort of Barry Warner to scan and digitize all manuscripts published in previous Volumes 1-19 and make them available electronically on CD.

After 20 years of service, I retired as Editor-in-Chief at the end of 2006. Darold Batzer was selected as the new editor and brought with him new ideas and practices, including invited special feature papers. Bridgham et al. (2006) was the first paper featured, and it has become the most cited *Wetlands* article. Darold also established an award for outstanding Associate Editor. The journal began on-line submissions in 2007, and a new glossy cover displaying a different wetland photograph on each issue was introduced with Volume 29 in 2009. Volume 30 marked the move from Allen Press to Springer Science and Business Media in New York, New York and conversion from four to six issues per year, available both electronically and in hard copy. The transition to Springer eliminated the need for journal support from SWS memberships and made *Wetlands* a net source of income for SWS. Darold completed his term as Editor-in-Chief in 2011 and was succeeded by Marinus Otte, who continued to maintain the updates and upgrades, as well as adding the invited Mark Brinson

TABLE 2. Partial listing of journal outlets for wetland-related manuscripts when *Wetlands* began publication in 1981. Edited books, agency reports, and gray literature were other options.

American Journal of Botany	Estuarine, Coastal, and Shelf Science
American Midland Naturalist	Fishery Bulletin
Applied Ecology	Ibis
Aquatic Botany	Journal of Ecology
The Auk	Journal of Soil and Water Conservation
Bulletin of the Torrey Botanical Club	Journal of Wildlife Management
Canadian Journal of Botany	Limnology and Oceanography
Colonial Waterbirds	Rhodora
Ecology	Soil Science Society of America Journal
Estuaries	Water Resources Bulletin

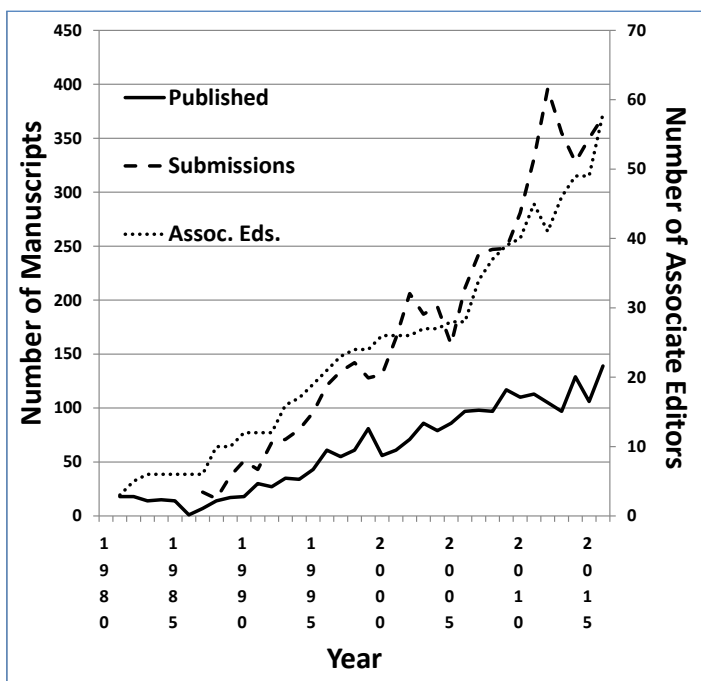
Review Series. Marinus also broadened the international scope of the Editorial Board. The journal cover changed in 2012 to a multi-color set of photographs that remains the same on each issue. The formatting of some of the internal material also changed in 2014.

GROWTH OF THE JOURNAL

Data are lacking regarding submissions prior to 1987, but new manuscript submissions increased from 22 in 1987 to 68 by 1992 to 142 in 1998 (Figure 1). They reached 206 in 2002 thanks to a boost from special issue manuscripts and averaged over 180 until on-line submissions were introduced, which raised the average to about 250, and they are now averaging over 350. The change to an on-line process also increased submissions by non-U.S. authors, which had averaged about 15% of the total in recent years but jumped to 50% in 2010. By 2016, submissions by non-U.S. authors had increased to 83%.

More overall submissions meant more papers published each year. Totals increased from the teens in the late 1980s to more than 50 by 1996, more than 80 by 2003, nearly 100 by 2006, more than 110 by 2009, and an average of about 115 in recent years (Figure 1). Total pages increased from 197 in 1988 to 488 in 1991; the journal then switched to a larger page format, and total pages increased from 234 in 1992 to 577 in 1997 to 806 in 2002 to 1167 in 2006 and since have averaged over 1250. The numbers of issues, manuscripts, and pages per year include 13 special issues,

FIGURE 1. Changes in numbers of manuscripts submitted and published in *Wetlands* during the first 36 years, along with the number of Associate Editors handling manuscripts.



83 special feature papers, 12 review papers, and 98 book reviews. More submissions meant more work, especially by Associate Editors that assign manuscripts to referees, review manuscripts, and make the initial judgment on acceptance. To spread the workload, more Associate Editors were added through the years to keep pace with submissions (Figure 1), resulting in an unintentional but strong correlation between submissions and Associate Editors ($r = 0.967$, $p = 0.000$). Acceptance rates averaged about 55% through 1997, about 43% through 2006, and about 36% since then. The journal was first assigned an Impact Factor (IF) of 0.644 in 1997, and IF has increased steadily since then to 1.573 for 2016 (the most recent measure).

RELATION TO EVOLUTION OF WETLAND SCIENCE

How has the journal *Wetlands* helped shape the field of wetland science? Perhaps foremost, it put a brand name on the work done by legions of plant ecologists, hydrologists, wildlife biologists, biogeochemists, invertebrate ecologists, soil scientists, herpetologists, geologists, remote sensing specialists, and paleoecologists, among others, working across a range of ecosystems from salt marshes to peatlands to freshwater marshes to swamps of many kinds. Those scientists were no longer on the outer fringe of another field, they were center stage in their own science. Every paper published in *Wetlands* was about wetlands, just as every presentation made at an SWS meeting was about wetlands. There was an identity, and the journal's title stated it in a single word.

The broad scope of disciplines within wetland science, and therefore papers published in the journal, exposed individuals to new ideas, methods, and applications for their work. For example, plant ecologists were no longer fixed on botanical journals, and hydrologists were no longer fixed on hydrology journals. The argument could be made that "ecohydrology" had its origins in wetland science. This intellectual cross-fertilization also served to strengthen the new scientific field.

Without participation from scientists in the variety of disciplines described above, advancement of wetland science would not have occurred. A conscious effort was made to invite, cajole, and plead to get many of the leading scientists in each discipline to serve as Associate Editors for *Wetlands*. Their names in the journal and their expertise and hard work in ensuring the quality of papers published did not go unnoticed. Those scientists also published their own work in the journal and brought in their colleagues and students. Publishing in *Wetlands* gained prestige. Zhang et al. (2010) reviewed Science Citation Index to generate a ranking of journals that publish wetland-related papers. *Wetlands* was at the top of the list with three times

more papers published during their 1991-2008 time window than any other journal (Table 3). As I reviewed every word and punctuation mark in every citation of 1019 papers published during my 20 years as editor, my greatest joy was in watching the number of citations of papers in *Wetlands* steadily increase. Citations identify quality papers, and quality papers make for a quality journal. As *Wetlands* gained stature as the leading journal in its field, wetland science found firm footing. ■

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TABLE 3. Number of wetland papers published and general subject category of journals, 1991-2008, from Zhang et al. (2010).

Journal Name	Number of Manuscripts	Subject Category
Wetlands	850*	ecology, environ. sciences
Ecological Engineering	358	ecology, environ. engineering, environ. sciences
Hydrobiologia	269	marine/freshwater biology
Journal of Environmental Quality	206	environ. sciences
Journal of Wildlife Management	192	ecology, zoology
Aquatic Botany	189	plant sciences, marine/freshwater biology
Environmental Management	176	environ. sciences
Water Research	173	environ. engineering, environ. sciences, water resources
Biological Conservation	163	biodiversity conservation, ecology, environ. sciences
Journal of Hydrology	156	civil engineering, geosciences, water resources
Environmental Science and Technology	153	environ. engineering, environ. sciences
Biogeochemistry	149	environ. sciences, geosciences
Science of the Total Environment	145	environ. sciences
Ecological Applications	143	ecology, environ. sciences
Soil Science Society of America Journal	126	soil science
Journal of Geophysical Research	126	Geosciences
Journal of Coastal Research	117	environ. sciences, physical geography, geosciences
Chemosphere	112	environ. sciences
Water Resources Research	102	environ. sciences, limnology, water resources
Water, Air, and Soil Pollution	102	environ. sciences, atmospheric sciences, water resources
Freshwater Biology	100	marine/freshwater biology

* Correct number for *Wetlands* should be 1158.