2019 PUBLICATIONS COMMISSION REPORT[1]

August 10, 2019

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With contributions from the AMS Publications Team: Gwendolyn Whittaker, Sharon Kristovich, Mike Friedman, and Sarah Jane Shangraw

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[1] AMS Publications Reporting Manager Dr. Sharon Kristovich deserves special credit for programming EM/PM to generate tables and figures in this report.

EXECUTIVE SUMMARY

2018 PUBLICATIONS COMMISSION (PC) REPORT EXECUTIVE SUMMARY

This report provides highlights of the 2018 publication activities for AMS scholarly publications. The list of 2019 Editors for each journal is included as are anticipated changes for the 2020 Editorial Boards. The list of nominations for 2020 Editor's Awards are also given.

Council action (yellow highlights) is requested for initial 3-year appointments for Mingfang Ting as the new Co-Chief Editor of JCLIM and Anne Smith as Chief Editor of JAS. Their CVs are included as Appendix D and Appendix E, respectively. Two-year reappointments of Tim DelSole as Co-Chief Editor of JCLI and Greg McFarquhar as Chief Editor of MONO are also requested. Council Action is requested to revise the TOR for WCAS and the title of a special section of WAF.

A total of 3317 manuscripts of all types (including BAMS proposals) were received by the 11 AMS scholarly journals in 2018, a decrease of just over 1% from the submissions in 2017. Possible reasons for the decline are discussed in the report. The average time to first editorial decision was 58 days, almost two weeks below the PC goal of 70 days. This is the fifth year the PC conducted an extensive statistical study of this statistic. The results for 2018 are summarized in Table 1 and Figs. 4 and 5 of this report. Author success has declined to 58%. In 2018, the number of published pages was 32,414, down about 8% from the all-time record set in 2017. A total of 1784 articles were published in 2018. The full report gives a complete summary of journal statistics and rankings. Progress on the 100th Anniversary monograph is also discussed in the report.

This report summarizes other issues and actions addressed by the PC. These include recommendations on the business model for AMS Publications, recommendations on the "article of the future," a report from the *Earth Interactions* subcommittee, and an update on progress related to the Special AMS Centennial Monograph. The report also describes the proposed implementation plan for significance statements, the status of *Meteorological Monographs* in online indices, the implications of the IPCC submission deadline, and next steps to facilitate implementation of so-called "tail" papers.

INTRODUCTION

This report provides highlights of the 2019 publication activities for AMS scholarly publications. The report is divided into three parts, (1) Publication Commission makeup and awards, (2) AMS Publications Performance and (3) Issues and Actions of the Commission. The list of 2019 editors for each journal is included and anticipated changes for the 2020 Editorial Boards are given. Also included is a list of 2020 Editor's Award nominations; the AMS Awards Oversight Committee has approved these nominations for Council consideration. Council action (yellow highlights) is requested for initial 3-year appointments for Mingfang Ting as the new Co-Chief Editor of JCLIM and Anne Smith as Chief Editor of JAS. Their CVs are included as Appendix D and Appendix E, respectively. Two-year reappointments of Tim DelSole as Co-Chief Editor of JCLI and Greg McFarquhar as Chief Editor of MONO are also requested. Council Action is requested to revise the TOR for WCAS and the title of a special section of WAF. Considerations raised by the Council at previous meetings, and other issues raised by the Commission are covered in detail in Part III.

PART I: PUBLICATIONS COMMISSION MAKEUP AND AWARDS

The AMS Publications Commission currently consists of the 13 Chief Editors, the Chair of the BAMS Editorial Board, the Chief Editor of the *Glossary of Meteorology*, the Past Commissioner, and three at-large members, all supported by AMS staff. AMS journals currently have 132 Chief Editors and Editors, including BAMS. Appendix A shows the current status of our Editorial Boards of all journals except BAMS. We have appointed new Editors across the journals, as needed to cover increasing workloads or specific disciplines. With the PRSA model, adding new Editors has minimal financial implications for the AMS but expedites the workflow for the Editors, improving the overall speed of the editorial process.

The Commission seeks Council approval for appointment or re-appointment for the following Chief Editors:

JCLI	**Tim DelSole**	2-year extension to December 31, 2021
JCLI	**Mingfang Ting**	Initial 3-year appointment to December 31, 2022
MONO	**Greg McFarquhar**	2-year extension to December 31. 2021
JAS	**Anne Smith**	Initial 3-year appointment to December 31, 2022

EDITOR AWARDS

The list of 2019 Publications Commission nominees for Editor's Awards is shown in Appendix B. The AOC has approved these nominations and recommended them to Council for approval.

[1]Journal abbreviations are as follows: JAMC—*Journal of Applied Meteorology and Climatology*; JAS—*Journal of the Atmospheric Sciences*; JCLI—*Journal of Climate*; JHM—*Journal of Hydrometeorology*; JPO—*Journal of Physical Oceanography*; JTECH—*Journal of Atmospheric and Oceanographic Technology*; MWR—*Monthly Weather Review*; WAF—*Weather and Forecasting*; WCAS—*Weather, Climate, and Society*; BAMS—*Bulletin of the American Meteorological Society*; EI—*Earth Interactions, MONO—Meteorological Monographs; GOM—Glossary of Meteorology*

PART II: AMS PUBLICATIONS PERFORMANCE

1. 2018 Editorial Operations and Submission Trends

A summary of the 2018 publications submissions and editorial decisions is shown in Table 1. Table 2 shows the 2017–2018 change in each journal's submissions. Figure 1 is a plot of the number of submissions (including EI beginning 2014) from 2008 to 2017.

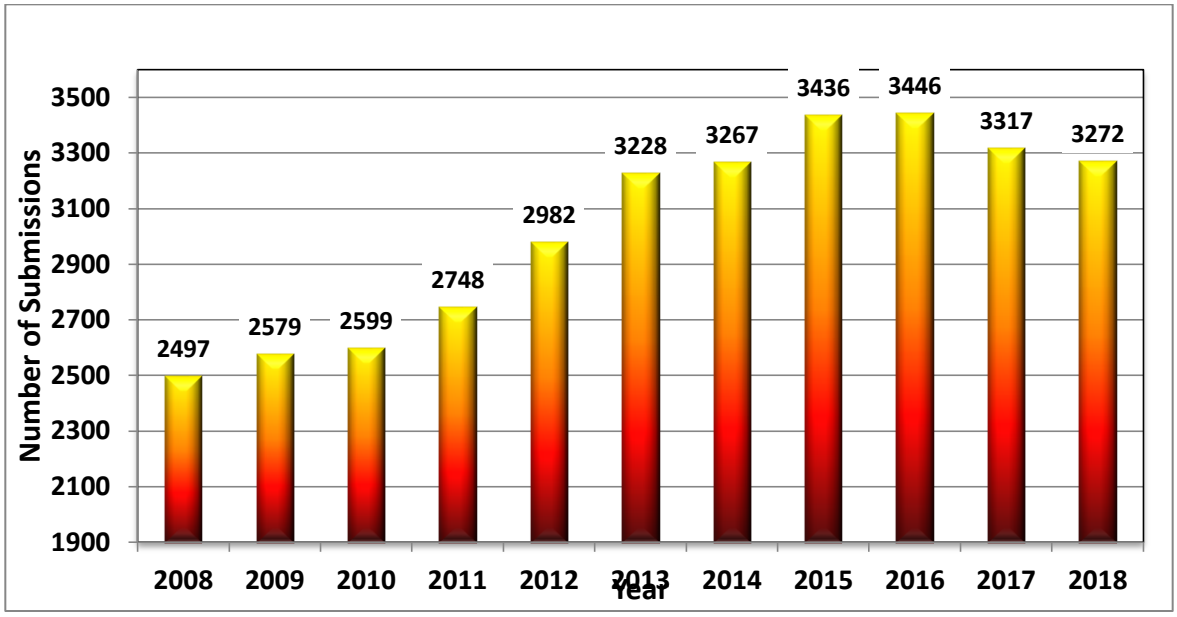
Table 1: Summary of submissions to AMS journals in 2018

Publications Commission -Journal Summary – 01 Jan thru 31 Dec 2018

			Final Dispositions that were:			Initial Decisions that were:		Average Days to:	
Journal	Submissions Received	Total Final Dispositions	Accept	Reject	Withdrawn	Major Revision	Minor Revision	Initial Decision	Final Disposition
BAMS	296	290	167	118	5	92	65	42.7	102.6
EI	19	35	16	17	2	18	1	80.1	184.4
JAMC	318	292	141	146	5	146	30	61.5	156.3
JAS	335	320	217	97	6	183	52	58.5	158.5
JCLI	849	797	485	293	19	462	79	61.1	159.7
JHM	235	213	107	103	3	83	34	58.9	135.6
JPO	254	267	168	90	9	144	43	58.9	168.9
JTECH	221	199	128	66	5	106	43	69.2	176.8
MWR	431	387	224	154	9	205	47	47.0	133.9
WAF	188	169	89	76	4	79	17	49.2	117.6
WCAS	126	140	59	74	7	49	7	80.1	167.2
Total	3272	3109	1801	1234	74	1567	418	58.0	149.3
			57.9%	39.7%	2.4%	50.4%	13.4%		

Table 2: Difference between 2018 and 2017 for all Journals

Journal	Submissions Received 2017	Difference 2018-2017	% Change 2017-2018
BAMS	315	-19	-6.4%
EI	34	-15	-78.9%
JAMC	336	-18	-5.7%
JAS	373	-38	-11.3%
JCLI	854	-5	-.6%
JHM	224	11	4.7%
JPO	262	-8	-3.1%
JTECH	220	1	.5%
MWR	385	46	10.7%
WAF	176	12	6.4%
WCAS	138	-12	-9.5%
Total	3317	-45	-1.4%



*=EI included in totals beginning in 2014

Figure 1: Annual submissions to AMS journals since 2008.

A total of 3272 manuscripts (including BAMS proposals) were received by the 11 AMS scholarly journals in 2018, a decrease of just over 1% from the 3317 submissions in 2017. Note that EI was not included prior to 2014. Declines in submissions occurred in 7 of the 11 journals. Only JHM, MWR, and WAF saw significant growth. This is the second consecutive year in which a decline occurred, although the rate of decline was considerably slower than the previous year. The reasons remain unclear, but could include page charges, open access availability, ISI ratings, and the proliferation of journals available to the scientific community. It is also possible that the decline over the past two years will not be sustained. Figure 2 provides some evidence in support of this hypothesis. In the first four months of 2019, 1224 manuscripts were submitted to AMS journals, including BAMS proposals, which is an 8.6% increase in submissions over the same period in 2018 and the largest number of manuscripts submitted during that period in the past nine years. If an equivalent percentage increase were to occur during the remainder of the year, the total number of submissions would rise to 3553, exceeding the number of submissions received in 2015 and 2016, the two highest years on record. At this time it is unclear if there has been a hiatus in an otherwise upward trend, a plateau with fluctuating submission numbers, or the beginning of a downward trend, but the statistics from early 2019 suggest that the last of these is less likely.

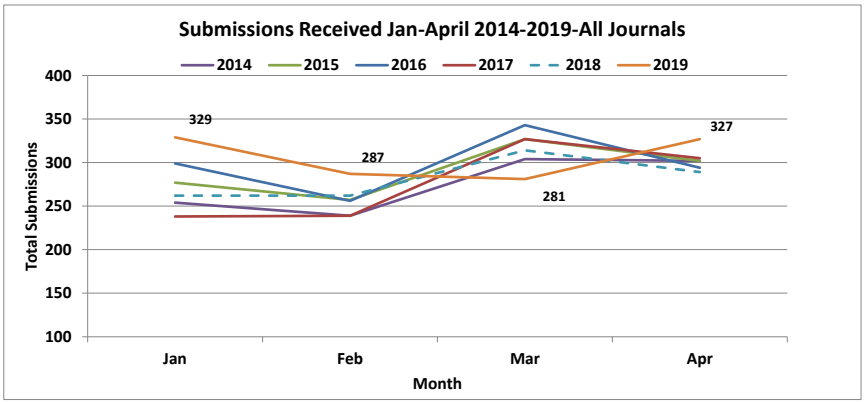


Fig. 2: Total submissions to AMS journals Jan through April 2014-2018

Figure 3 provides a longer-term historical view (2008-2018) of the quantity of submissions to each AMS journal. The trends over the last decade show clear differences among the journals. Although most journals experienced increases early in the period followed by a plateau or slight decline, others show a more recent increase, such as WCAS and BAMS. The growth in WCAS is notable and appears to be a response to the removal of page charges by Council. It is also notable that none of the journals had their greatest number of submissions in 2018. The year of maximum submissions to each journal ranged from 2012 to 2017, with the greatest number of journals reaching their peaks in 2016. Viewed on a journal-by-journal basis, it may be premature to assert that the upward trend in submissions evident early in the period has reversed, but the data suggest that submissions to most journals appear to have fluctuated around a plateau or a slight downward trend. Early indications from 2019 are suggestive of an uptick in submissions, but only time will tell if this apparent increase will be sustained.

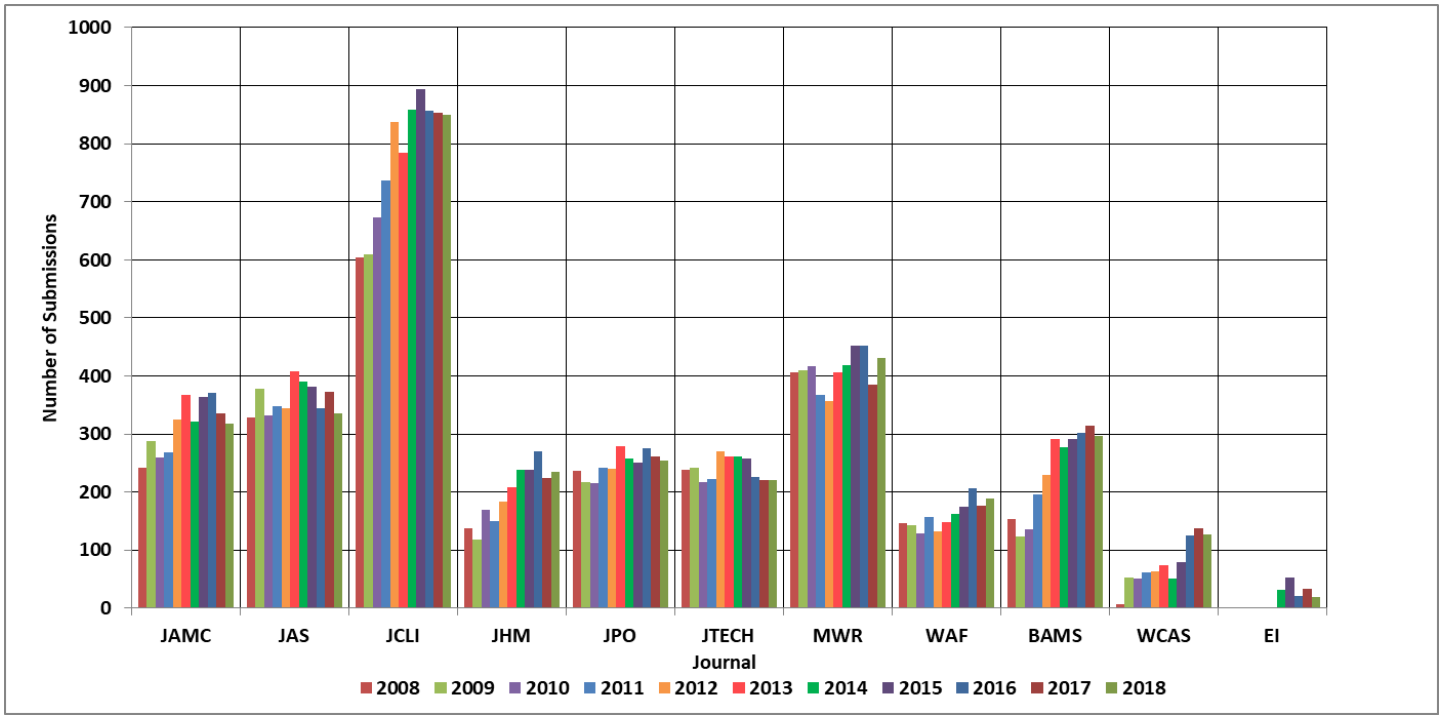


Figure 3: Submissions to AMS journals since 2008

The time for first editorial decision can be seen in the column labeled "Average Days to Initial Decision" in Table 1. The 18-year evolution of this parameter can be visualized in Fig. 4. This is one important metric for editor performance. With continued emphasis within the Commission for improved author service, the time to first editorial decision has been decreasing since 2002 (from 110 days to 58 days in 2018). For the seventh year in a row, we have reached our stated Commission goal of 70 days. In Table 1 and Fig. 5, we see that two journals (EI and WCAS) did not reach the 70-day goal; all others have surpassed the goal, with six journals under 60 days, and three of those under 50 days. Historically, WCAS and EI have had more difficulty finding reviewers. Fig. 6 shows the average time a manuscript spends in each step in the process between submission and initial decision. WCAS stands out as spending more time than most journals before entering peer review and EI has the longest time during which the manuscript is under review. As in previous years, EI also has longer times in technical check, suggesting authors are not familiar with AMS submission procedures.

For the fourth year, the PC examined the complete statistics of the time to initial decision to try to understand and control outliers. Figure 7 shows these statistics for all journals in 2018. Each Chief Editor is now supplied with a similar graph of their journal. The Chiefs now examine histories of papers that lie on the tail of the distribution. Most have author- or manuscript-specific issues. However, if the delays are found to be a performance problem with a specific editor, that editor is notified. If performance is not improved, the editor is no longer assigned papers and is retired at the end of their term.

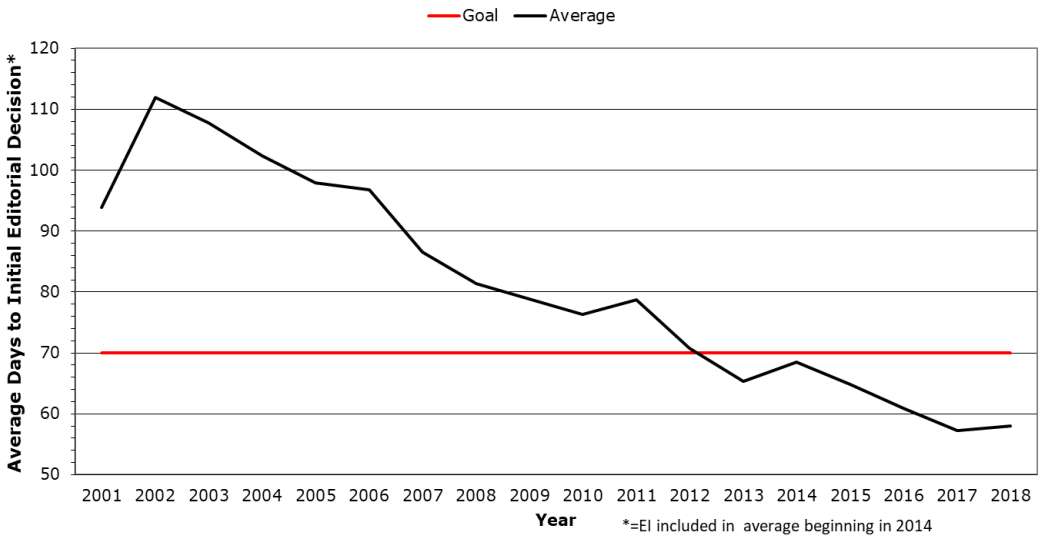


Figure 4: Time to initial decisions for all manuscripts submitted to AMS journals (including BAMS proposals)

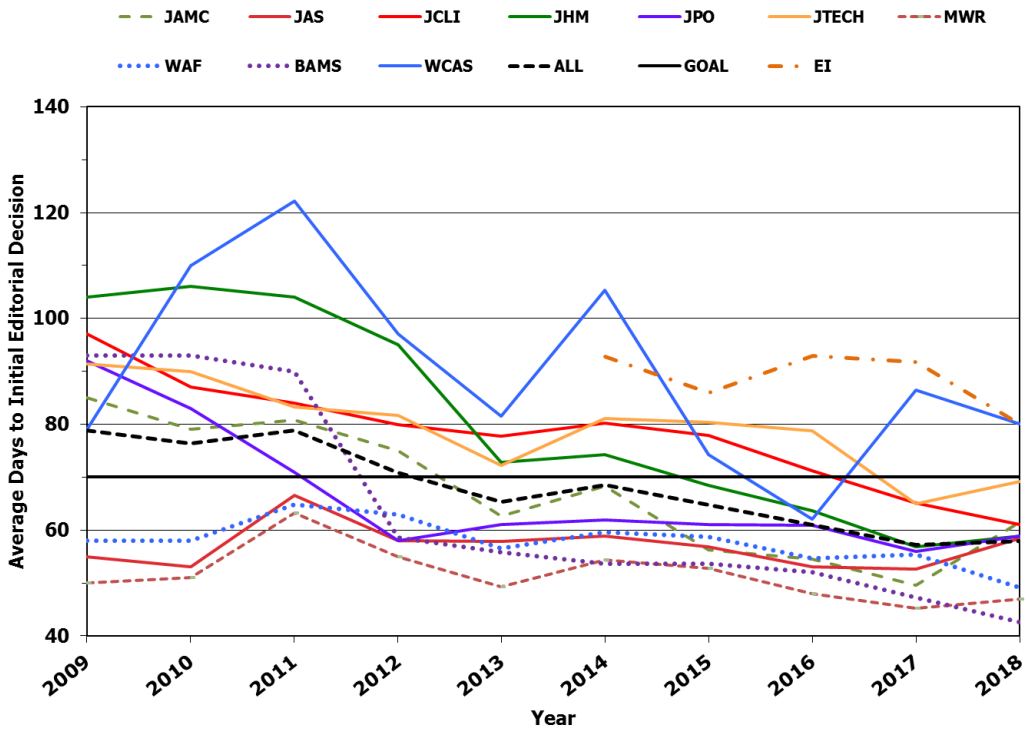


Figure 5: Time to initial decisions for manuscripts submitted for each journal

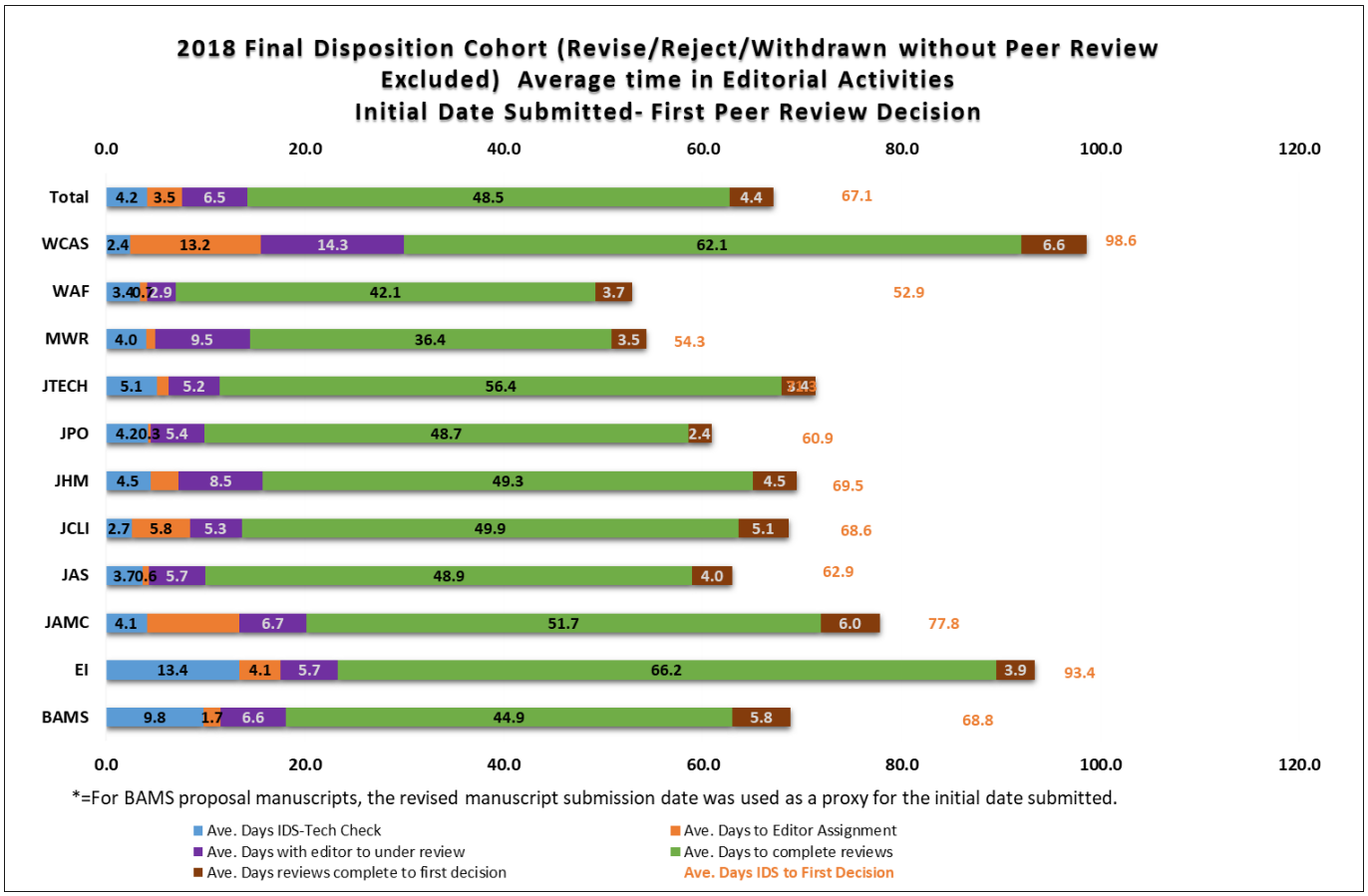


Figure 6: 2018 Time spent in tech check (qualification), with Chief Editor, with Editor, in review, and after review but before first decision.

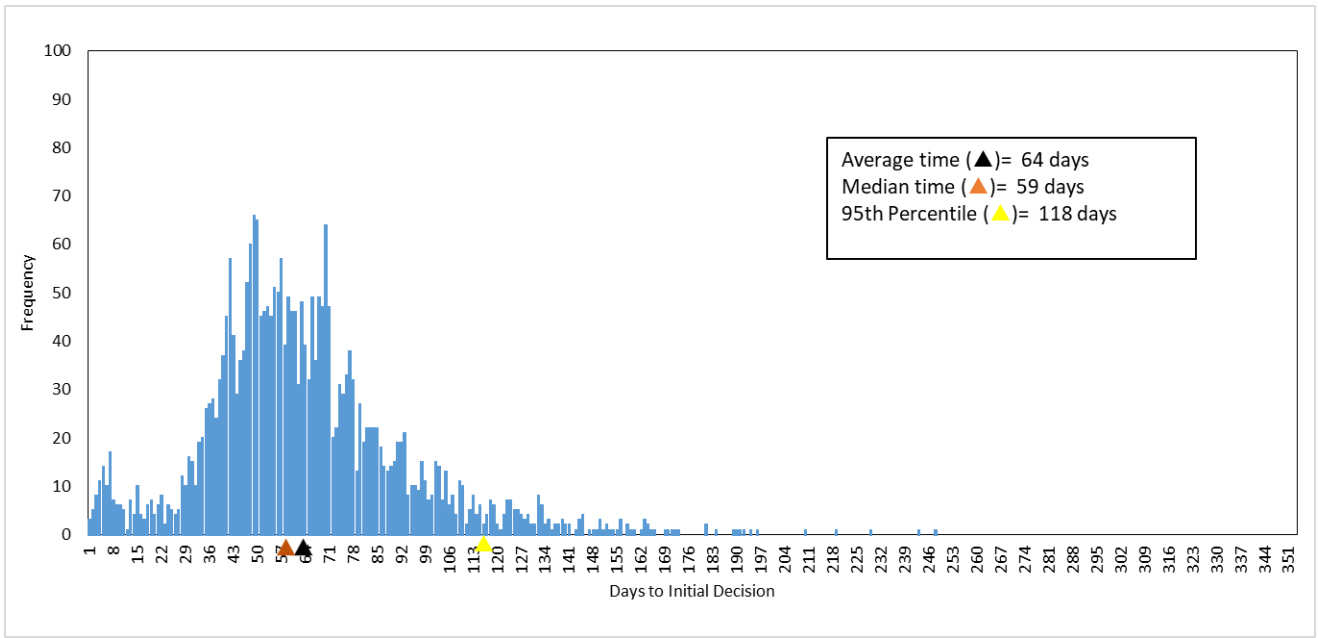


Figure 7: Frequency distribution of 2018 days to first decision for all AMS journals. Manuscripts rejected/withdrawn prior to peer review are excluded.

Author success rate (57.9%) has experienced a slow but steady decline. Fig. 8 shows the rates of accepted, rejected, and withdrawn manuscripts over the last six years. The percent withdrawn has declined slightly, but the percent of rejected manuscripts has increased slowly from 33% to just under 40%. There are likely a number of reasons for this increase in rejected manuscripts, such as an increase in submissions from authors whose native language is not English, and better attention to plagiarism and self-similarity occurrences by the Chief Editors and Editors because of the use of CrossCheck/Ithenticate software. Because the upward trend in rejections accelerated in 2018, the Commission will closely monitor these statistics and their implications. That said, the decision to accept or reject a manuscript is a matter of scientific judgment that is delegated to our Editors and not managed in a top-down manner.

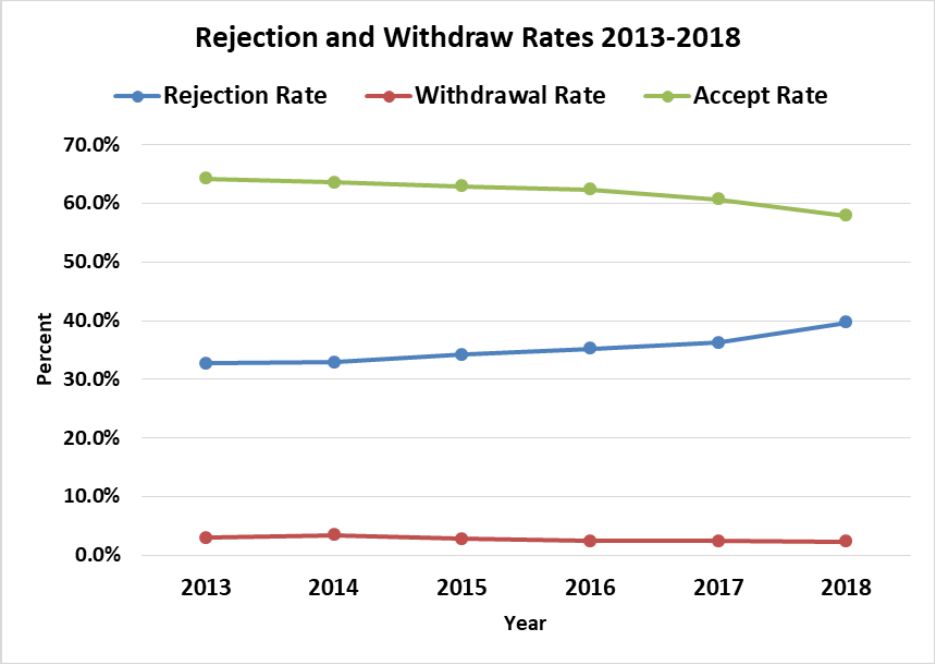


Figure 8: Six-year history of acceptance, rejection, and withdrawal rates for AMS Journals

2. Editor Performance

The AMS Editorial Board consists of 130 Chief Editors/Editors of scholarly journals including BAMS. The metric that the Publications Commission uses to gauge Editor Performance is based on the time to first editorial decision for a new manuscript. The top-performing Editors, in terms of quickest time to first editorial decision for manuscripts that were not rejected without review, and handling large numbers of manuscripts, are shown in Table 3. It is worth noting that the time to first decision is not all in the Editor's hands but involves several steps. Figure 6 summarizes these steps and the time spent in each step for each of the journals in 2018. We continue to look at ways to reduce time in each step of the process to continue to reduce the time from submission to first decision.

For the last four years, Chief Editors have been provided with performance data for all Editors in tabular form to assist the Chiefs in determining if any Editor, for whatever reason, has not been able to keep up with the workload associated with their assignments. These tables also let Chiefs

know if any particular Editor is overloaded with papers, for example, because the area of their expertise is currently a very active area of research. In this case, the Chief can petition the Commissioner to bring on an additional Editor to share the workload and keep the number of manuscripts handled by any individual sustainable, particularly since editorial duties represent a volunteer activity that a person does outside of their regular employment.

Table 3: Gold, silver, bronze star editors, and incredibly busy editors for 2018*

Journal	Editor	Ave. Days to Initial Decision	# Final Dispositions
BAMS	Richard Rosen	27.3	12
JCLI	John Chiang	30.7	23
BAMS	Martin Hoerling	30.7	19
MWR	Ron McTaggart-Cowan	32.2	29
MWR	David Schultz	37.3	41
JAMC	David Kristovich	39.3	29
WAF	Matthew Bunkers	41.9	31
JPO	Paola Cessi	43.0	29
WAF	Zhaoxia Pu	44.3	20
JPO	Gregory Foltz	45.9	26

Journal	Editor	Ave. Days to Initial Decision	# Final Dispositions
MWR	Hugh Morrison	46.6	14
JAS	Walter Robinson	46.7	32
BAMS	Tammy Weckwerth	47.1	15
MWR	Daniel Kirshbaum	47.3	18
MWR	Christopher Weiss	47.6	11
JCLI	Oleg Saenko	48.8	41
MWR	Russ Schumacher	50.0	23
WAF	Elizabeth Ritchie	51.4	13

Journal	Editor	Ave. Days to Initial Decision	# Final Dispositions
MWR	Hilary Weller	52.5	17
JAS	Wojciech Grabowski	52.6	17
JAS	Robert Fovell	53.4	21
JHM	Faisal Hossain	53.7	30
WAF	Gary Lackmann	54.0	21
JCLI	Timothy DelSole	54.3	55
BAMS	Jeff Waldstreicher	54.3	10
JCLI	Rong Zhang	54.6	45
MWR	Matthew Eastin	54.9	26
JCLI	James Screen	55.1	34
JCLI	Matthew Collins	55.4	42
WAF	Karen Kosiba	55.4	18

* Manuscripts rejected without entering peer review were excluded from these averages.

Editors[1] that Handled 50 or More Papers in 2018 and Took 58 Days or Less to Make a First Decision[2]

Journal	Editor	Total Handled	Ave. Days to First Decision
JCLI	Rong Zhang	55	54.6
JCLI	Matthew Collins	55	55.4
JCLI	Oleg Saenko	52	48.8
JCLI	James Screen	52	55.1

[1]Chief Editors excluded
[2]Average days to first decision excludes manuscripts that were rejected or withdrawn before peer review.

3. Production Time and Article-Based Workflow

Production time is defined in various ways by different publishers. For AMS journals, production time has traditionally been defined as the number of days between editor acceptance of a paper following peer review and the appearance of the final article online. The AMS publications staff processed 1790 accepted articles in 2018, including monograph contributions that now have a similar workflow to journals. With the "continuous publication," or article-based, workflow that has been in place since 2015, articles are posted online as they are ready. The overall average production time for 2018 (all journals) was 60 days (down from 70 days for 2017). The publications department is currently achieving their lowest production times ever for the journals, with ten individual journal issues in 2018 having production times of less than 60 days. Over the longer term, average production time has decreased from 140 days in January of 2014 to 51 days in December 2018 (Fig. 9). Reducing production time continues to be a primary concern of AMS and authors.

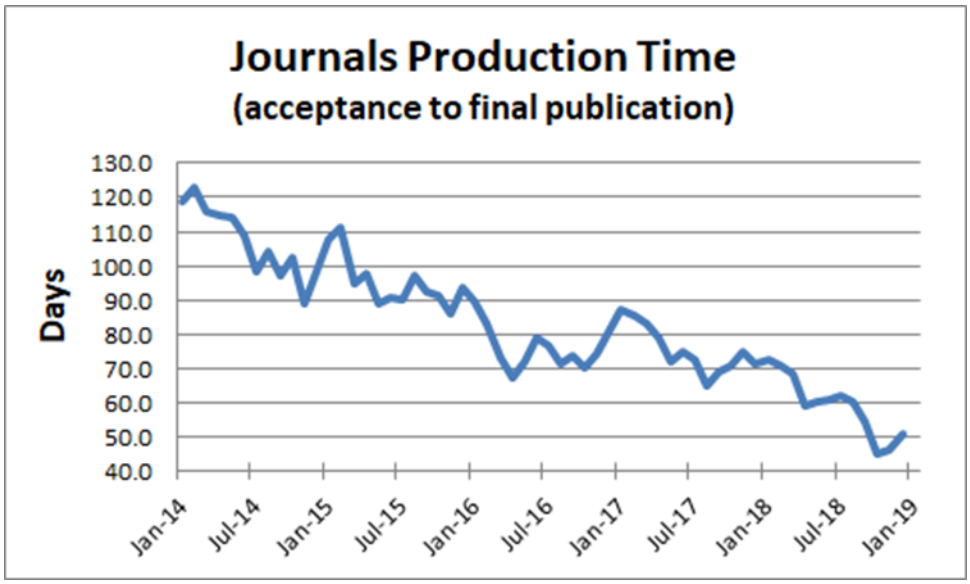


Figure 9: Production time for all technical journals

4. Published Pages

Figure 10 shows the trend in published pages in AMS journals since 2008. In 2018, the number of pages published was 32,414, down about 8% from the all-time record of 35,417 set in 2017. Figure 11 also shows the number of articles and average pages per article. The number of published articles also decreased by a similar percentage to 1784, while the length of articles increased slightly to just under 18 pages. The time series of number of articles published is complicated to interpret, because faster production times reduced a backlog of papers that had developed earlier in this decade. The peak in 2014 reflects the increased publication rate that was associated with the reduction of the backlog. The decrease from 2017 to 2018 is likely due to a combination of the decrease in submissions relative to the 2016 peak (bearing in mind the lag between submission and publication) and the decrease in acceptance rates.

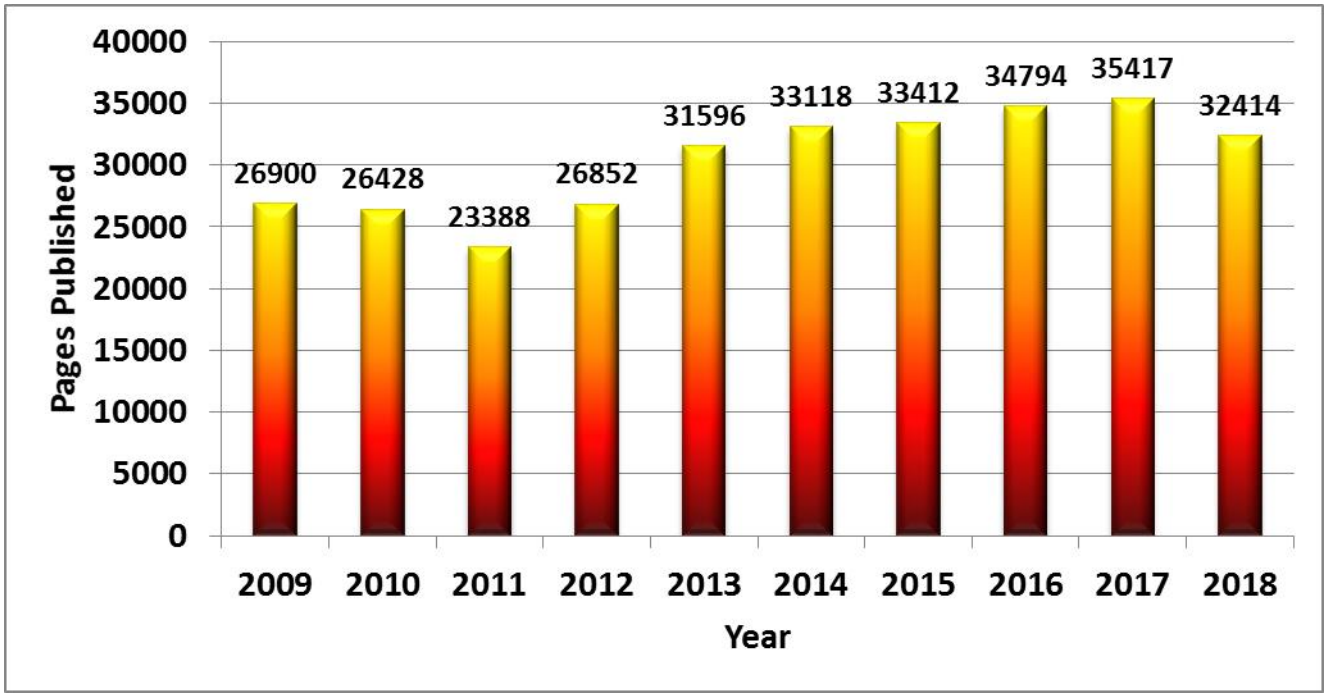


Figure 10: Trends in published pages in AMS journals since 2009

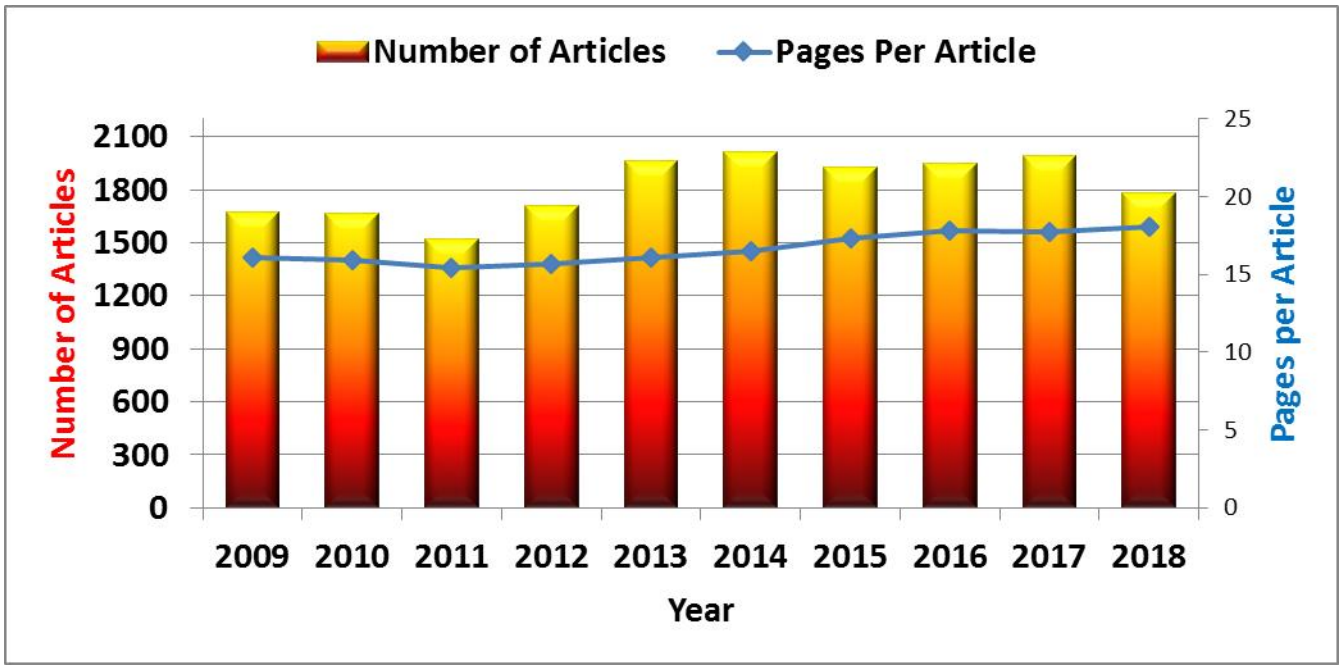


Figure 11: Trends in number of articles and pages per article in AMS journals since 2008

5. AMS Books

2019 UPDATE (July 5, 2019):

A change in approach is being implemented for the Books Program. Despite efforts to expand the program over the past decade, it has not become financially self-sustaining. In spring 2019, staff explored external partnership options to maintain the program, but given the small and specialized nature of the AMS Books offerings, such options were not feasible. As the publications department

must focus its resources on the technical journals and on providing publishing support for BAMS, the decision was made to ramp down the Books program. As of June 2019, AMS Publications is no longer actively acquiring new book titles. AMS is committed, however, to publishing the books for which there are existing contracts with authors, and there are several of these in various stages of preparation. In addition, AMS plans to continue to support these books, as well as books previously published, with the online bookstore and the distribution partnership with University of Chicago Press. All authors of books under contract with AMS or with books in distribution via AMS have been contacted and informed of the changes. Current Books Managing Editor Sarah Jane Shangraw will remain on staff for some months to move existing projects through the pipeline but eventually the Books Managing editor position will be eliminated. After books for which there are existing contracts have been published, it is possible that AMS will, from time to time, take advantage of an opportunity to publish a book of particular importance to the community. This is expected to be a rare event, however, and AMS will not be actively seeking to expand its list of titles.

2018 Books Program Update

AMS Books published three new titles and one second edition, as follows.

At the Annual Meeting in Austin AMS released the biography *Verner Suomi: The Life and Work of the Founder of Satellite Meteorology*, written by a team of Suomi's associates led by John M. Lewis (National Severe Storms Laboratory and Desert Research Institute and University of Nevada–Reno) and organized by Jean M. Phillips (Space Science and Engineering Center, University of Wisconsin-Madison).

Soon after, AMS released *Climate in the Age of Empire: Weather Observers in Colonial Canada*. In her well-researched book, Victoria C. Slonosky draws from the journals of physicians, farmers, and ministers, as well as the records of state-sponsored natural philosophers and military personnel to illuminate the attitude of Europeans and colonists toward climate.

In advance of the fall 2018 eightieth anniversary of the "surprise" storm that changed the coast and interior landscape of New England as well as Weather Bureau standards and practices, AMS Books released a second edition of *Taken by Storm, 1938: A Social and Meteorological History of the Great New England Hurricane* by Lourdes B. Avilés.

And at the end of the year AMS published Sundar A. Christopher's *Navigating Tenure and Beyond: A Guide for Early Career Faculty*, covering professional and personal considerations facing graduate students making their way into the field as the author had.

What's to Come

Early 2019 saw the release of a second edition of the AMS bestseller *The Thinking Person's Guide to Climate Change*, by Robert Henson, sales of which are as strong as ever, and can be reported in the next update. By the end of 2019 AMS will have published an additional two new titles: an environmental security textbook and biography of Cleveland Abbe. The pipeline thereafter, as of 5 July 2019, includes:

- Overview of topics in meteorology and psychology
- A mutual history of photography and meteorology
- Severe storms and society (a communications study)
- Scientific and cultural history of atmospheric optics
- Handbook of atmospheric dynamics
- Second edition of *Eloquent Science*
- Second edition of *Midlatitude Synoptic Meteorology*
- Ted Fujita biography

6. Journal Impact Factor Ratings

Two-year Journal Impact Factors (JIF) and rankings, now provided by Clarivate, have been monitored by the Publications Department since 2011. The JIF is the average number of citations to articles published. Two-year JIFs are based on publications for the previous two years - e.g., the 2018 JIF uses publications from 2017 and 2016.

Journal*	Journal Impact Factor	Ranking
BAMS	8.166	3
EI**	2.457	80
JAMC	2.364	37
JAS	3.282	24
JCLI	4.805	9
JHM	4.158	12
JPO***	3.389	5
JTECH	2.224	43
MWR	3.146	27
WAF	2.288	40
WCAS	2.043	46

*All journals but EI and JPO are ranked in the Meteorology and Atmospheric Sciences category (86 ranked in 2018)
**EI is ranked in the Geosciences category (195 ranked in 2018)
***JPO is ranked in the Oceanography category (65 ranked in 2018)

Compared to 2017 JIF, 2018 JIFs increased for all journals except MWR and EI. BAMS, JPO and JHM each had increases larger than 0.300. Despite the increases in JIF, only a small number of journals with increases in JIF showed improvement in the rankings: JPO and JHM (-2). BAMS (3) and JAMC (37) had no change in their 2018 rankings. The remaining journals did not improve their rankings: MWR (+7), WCAS (+5), WAF and JTECH (+4), JAS and JCLI (+2). EI, ranked in the Geosciences category (195 manuscripts), was unusual in that it had the largest decrease in JIF, but also had the largest improvement (-18) in ranking. The Publications Department will continue to monitor trends.

7. Trends in Open Access Option

Currently, AMS journal articles have a one-year embargo on open access (OA) by non-subscribers. However, authors can pay a fee of $800 to have their articles open access immediately upon publication. The publications department continued monitoring uptake of the open access option. Figure 12 shows the percentage of interest in immediate OA as a percentage of total articles for all journals except BAMS, EI and Monographs from 2014-2017. Interest in open access increased approximately 5 percent per year from 2014 through 2017, with nearly 21% of all authors interested in OA in 2017. The OA interest rate for 2018 remained the same as 2017 (nearly 21%).

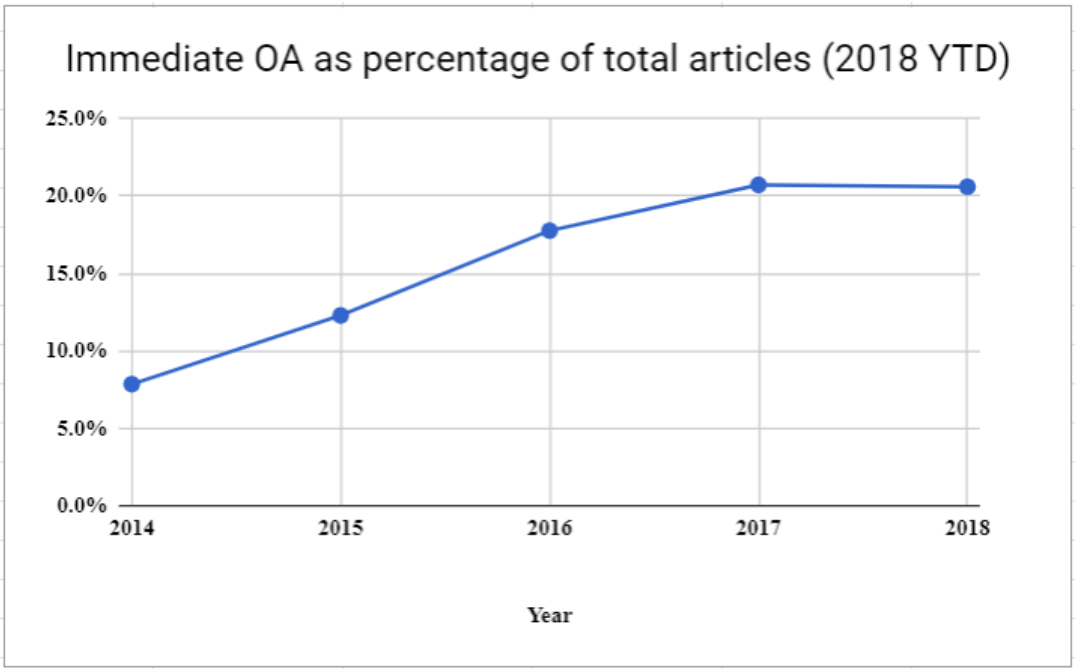


Figure 12: Percentage of interest in immediate OA as a percentage of total articles for all journals except BAMS, EI and Monographs from 2014-2017.

There are differences in the rate of interest in OA among journals from 2014-2018. Figure 13 shows the percentage of interest in immediate OA as a percentage of total articles by journal from 2014-2017. JAMC and JTECH increased in OA interest each year; JPO, MWR and WCAS OA interest increased from 2014-2017, then decreased in 2018; JHM, JAS, JCLI and WCAS each had a consecutive years where there was no increase in OA interest; JHM, JPO, MWR and WCAS each decreased in the OA interest between 2017-2018 and WAF decreased in interest rate between 2016-2017. WAF authors' interest in OA recovered close to 6% for 2018. Publications staff will continue to monitor these trends over 2019. It should be noted that effective with papers submitted 1 September 2019, the fee for immediate open access will increase to $1100.

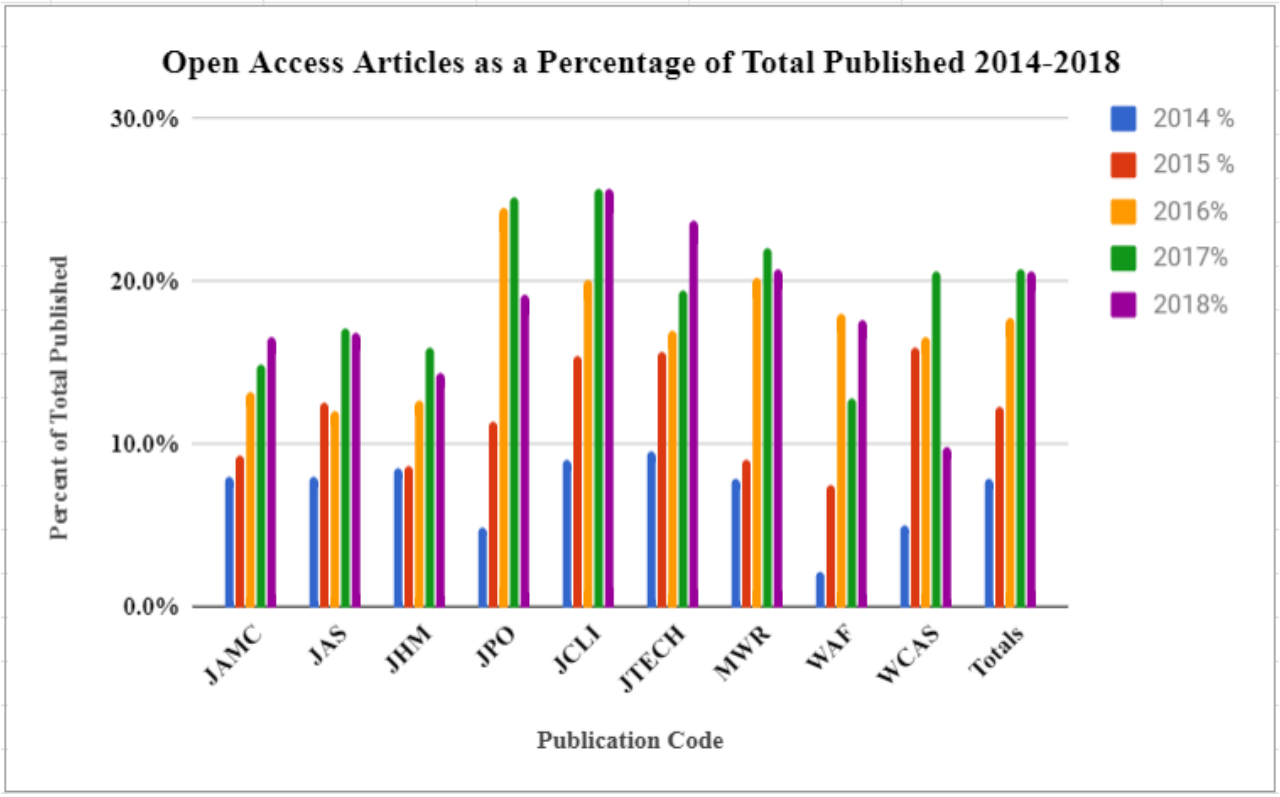


Figure 13: Percentage of interest in immediate OA as a percentage of total articles by journal from 2014-2017.

8. International Scope of AMS journals

The AMS received submissions from 118 countries and territories since we started using the current manuscript management system in 2012. The top 10 countries (U.S., China, U.K., Canada, Japan, Germany, Australia, France, South Korea and India) remain the same every year. The U.S., China and U.K. were always the top 3 each year, but the order may change slightly for the remaining countries.

Figure 12 summarizes the total submissions by corresponding author country over the last 8 years. U.S. Territories are included in the U.S. total and the 28 E.U. countries (including the UK) are combined to one total in this figure. Submissions by non-U.S. corresponding authors have increased and eclipsed U.S. submissions as a percent of the total since 2012. This increase is due mostly to the steady increase in submissions by Chinese corresponding authors during this time. E.U. submissions have had a slight increase from 2018-2019 but is still less than the nearly 17% submissions in 2012. Submissions from all other countries have decreased slightly since 2012.

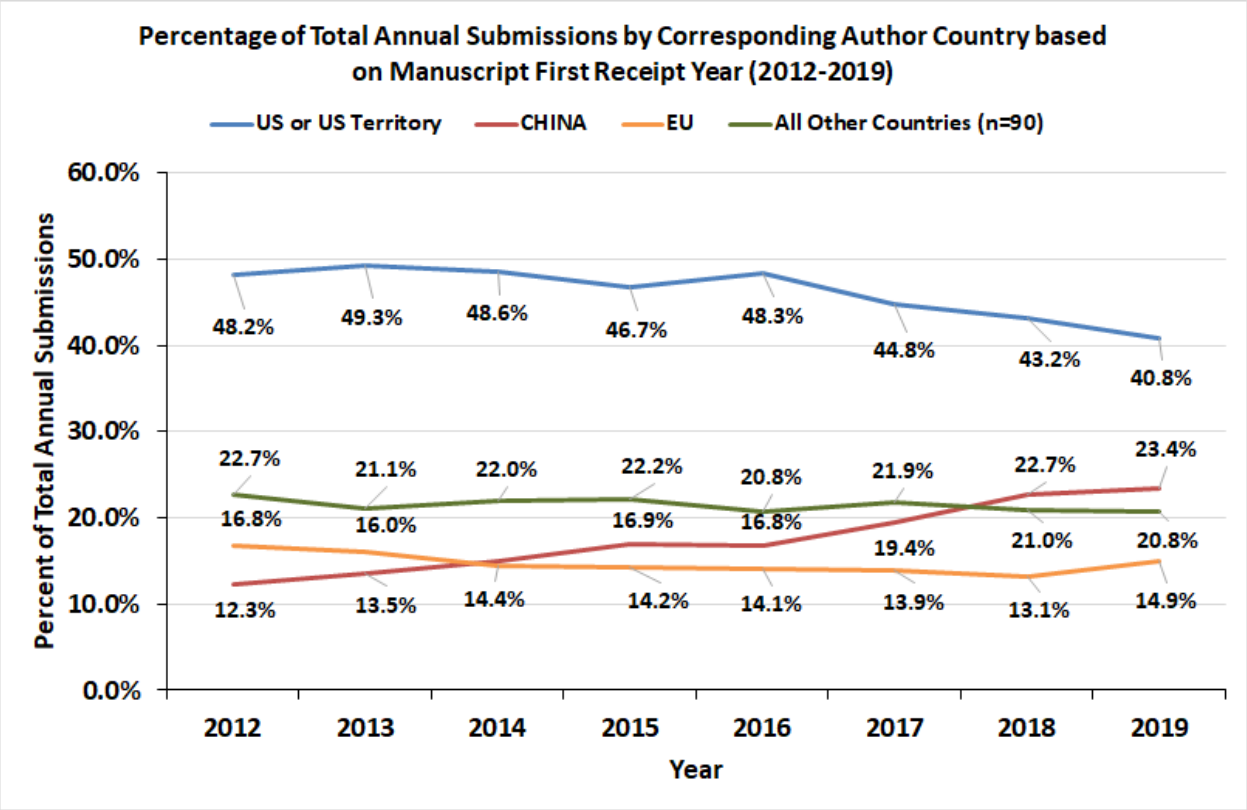


Figure 14: Countries of corresponding author of AMS journals during last 8 years.

PART III: ISSUES AND ACTIONS OF THE COMMISSION

9. Recommendations on business model for AMS Publications

The Publications Commission spent a large fraction of its May meeting discussing the business model for AMS Publications in light of the decrease in submissions to AMS journals since 2016 and ongoing changes in the landscape of scientific publishing, including the proposal by some European science agencies to make the research they fund open-access (OA) on publication ("Plan S"). AMS Executive Director Keith Seitter provided an overview of the expenses and revenues associated with AMS Publications and the importance of Publications revenue for support of other AMS programs. He also discussed some of the implications of Plan S and potential paths to satisfying its requirements.

There was a spirited discussion of this topic with considerable diversity of opinion, as might be expected in a group the size of the Publications Commission. Some members expressed the opinion that the requirement of "Gold OA" (i.e., all articles available for free immediately on journal website) by funding agencies is inevitable, while others were not at all certain that this would be the case. In support of the latter argument, Plan S has postponed its implementation date and revised its requirements such that they would be satisfied by "Green OA" (i.e., journals can maintain a paywall but allow immediate self-archiving by authors).

Among the concerns raised by Commission members about moving too quickly to Gold OA were the following:

- Subscription revenue is too important to eliminate.
- The decision to move to Gold OA would be, in effect, irreversible.
- Standards are still evolving, even among the Plan S funders.
- U.S. funding agencies have not proposed requirements similar to Plan S.

The general consensus was that although it would be premature to move too quickly to Gold OA, AMS should take the following steps:

- Investigate the consequences, financial and otherwise, of moving to Gold OA
- Prepare to move to the Green OA model when/if Plan S is implemented or similar requirements are mandated domestically
- Undertake market research to determine the extent to which OA influences authors' selection of journals in which to publish.

The Commission also discussed other alterations of the business model for AMS Publications to keep AMS journals financially viable and make them more attractive to authors. These discussions were informed by a previous survey of early-career scientists about the factors that motivate their selection of a journal. This survey indicated that journal reputation, fit to journal, cost, and speed were all weighted about equally. Fees for submitting manuscripts were considered, as under the current system rejected manuscripts provide no revenue even though they consume resources. Commercial partnership, such as AGU has undertaken with Wiley, were also considered, as were adjustments to current page charges.

Several recommendations emerged from this discussion:

- The integrity of the review process must be preserved irrespective of any changes in business model.
- AMS should maintain control of the publication process; commercial partnership should be a last resort.
- Submission fees may be counterproductive, as the added cost could discourage submissions.
- Reducing page charges may be the most effective way of attracting more submissions, as in most cases current page charges are somewhat higher than for AGU journals. An ad hoc committee should be established to explore this option.

It should be noted that the decrease in submissions in the last two years was the original motivation for exploring changes in the business model for AMS Publications, Although there is evidence that the trend in submission may reversed in 2019, this issue would remain important even if submissions were to resume an upward trend. The introduction of new journals has made the publishing environment more competitive and AMS should adjust to this changing environment.

10. Recommendations on "The Article of the Future"

Past Commissioner Bob Rauber led a discussion of a white paper developed by the Centennial Committee for Curation and Communication of Research in the 21st Century, which he chaired. The white paper is attached as Appendix F.

The Commission discussed this topic, with their primary focus on determining the highest priorities for making new types of content available in (or in association with) journal articles. In determining priorities, the pertinent considerations include the desires of authors and readers for new types of content, the technologies that exist for making such content available, and any new technologies that may be on the horizon.

Although all of the possibilities discussed in the white paper were deemed relevant and worthy of exploration, the Commission recommended that the highest priority is exploring the technical feasibility and cost of including animations as a peer-reviewed component of journal articles. This option should be made available to authors as soon as it is feasible, assuming that there would be little or reasonable cost.

11. Request for change in terms of reference for WCAS

The Publications Commission requests that Council amend the terms of reference for *Weather, Climate, and Society*.

The proposed terms of reference are: "*Weather, Climate, and Society* (WCAS) publishes research and reviews that address economics, policy analysis, political science, history, communication, and institutional, social, health, and behavioral scholarship and research relating to weather and climate, including both climate variability and longer-term climate change. Contributions must include evidence-based analysis and substantive discussion of the interactions of weather and climate with society, taking an integrated approach, drawing on both the social and physical sciences."

For comparison, the current terms of reference are: "*Weather, Climate, and Society* (WCAS) publishes research that encompasses economics, policy analysis, political science, history, and institutional, social, and behavioral scholarship relating to weather and climate, including climate change. Contributions must include original social science research, evidence-based analysis, and relevance to the interactions of weather and climate with society."

Justification: The proposed change makes more explicit the requirement that WCAS articles address the interactions of weather and climate with society, cutting across both the social and physical sciences. The change also explicitly identifies "climate variability" as an appropriate topic for WCAS articles. The proposed change will also better reflect the breadth of submissions WCAS receives and publishes, making it easier for authors, editors, and reviewers to recognize the topics and treatment thereof that are appropriate for the journal.

12. Request for change in title of special category of WAF articles

The Publications Commission requests that Council amend the title of the special category of articles in *Weather and Forecasting*, currently entitled "NCEP Notes." This category is described as: "Reports on changes to the suite of operational numerical models and postprocessing techniques."

The proposed title is "Operational System Notes" and the proposed category description is: "Reports on changes to the suite of operational prediction systems, including data assimilation methods, numerical models, and post-processing techniques."

Justification: The purpose of this change is to recognize that important advances in operational forecasting of interest to WAF readers can be associated with any number of operational systems. The change also explicitly identifies data assimilation as an appropriate topic for this category of articles.

13. Report from *Earth Interactions* subcommittee

The Publications Commission received a report from a subcommittee that had been tasked with developing recommendations for moving Earth Interactions forward. This report was discussed and the Commission makes the following recommendations:

- Revisit the Terms of Reference to better reflect the interdisciplinary nature of the journal.
- Explore the possibility of changing the journal name to something that will resonate with potential authors.
- Encourage guest editors/coordinators to solicit special collections.

14. Progress related to the Special AMS Centennial Monograph

As part of the AMS Centennial celebration, the Publications Commission and Council approved the development and publication of a monograph celebrating 100 years of scientific research at the AMS. The monograph will consist of 27 articles which together will review 100 years of progress at the AMS in key fundamental areas of research, and the grand challenges in those areas of research in the coming decades. We expect that the articles will have high visibility and should be well cited for multiple years after the monograph's publication.

As of June 23, 2019, 15 articles have been published online, 7 have been accepted, 1 is in second review, 2 are back with authors for major revision, and 2 are back with authors for minor revision.

The June 23, 2019 status of all contributions to the monograph appears in Appendix C.

Some key points about the monograph:

- The published volume will be for sale at 2020 AMS Annual Meeting in Boston.
- There will be no page charges to authors.
- All articles will be open access to increase their exposure.
- Although the printed volume will not be available until January 2020, articles will be published on-line as soon as they are accepted.

15. Implementation plan for significance statements

At its June 2017 meeting, the Publications commission considered ways to increase public access to the science reported in AMS journals. There are services now available through third party vendors, in particular Kudos (https://www.growkudos.com/about/), which enable authors to provide a "plain language" summary of their research published in scientific journals so that the public can become more aware of, and better understand the science conveyed in their papers. Kudos also provides tools for authors to promote their articles, primarily via social media.

Now that Kudos has been implemented, the next step to develop an implementation plan for peer-reviewed significance statements. The Commission recommended that significance statements should be optional, that such statements focus on what was done and why it matters, and that WAF and WCAS serve as pilot journals. Mike Friedman will work with the other members of the ad hoc subcommittee (Gary Lackmann, Chair, Rezaul Mahmood, John Chiang, Jeff Rosenfeld, and Gwendolyn Whittaker) to develop guidance to authors and reviewers for review by the Commission.

16. Status of Meteorological Monographs in online indices

The effort to have *Meteorological Monographs* articles listed in online indices has met with mixed success, with Scopus responding affirmatively and Web of Science negatively. The Publications Commission recommends that this issue should be revisited in another year when there will be a longer track record for the journal. The Commission also suggested that consideration be given to publishing a short summary of each monograph in BAMS.

17. Implications of IPCC submission deadline

For papers to be included in the Working Group I report of the IPCC Sixth Assessment, they must be submitted by December 31, 2019. Based on previous experience with such deadlines, it is likely that some journals (most notable JCLI) will see a spike in submissions in the weeks immediately prior to the deadline. (During the last IPCC cycle, more than 100 manuscripts were submitted to JCLI in the ten days prior to the deadline.)

To address this potential glut of incoming manuscripts, the Publications Commission agreed to allow Editors to work across journals if they have the appropriate expertise to relieve the burden on Editors of a journal that is heavily targeted with submission. In addition, the Publications Commissioner will make short-term appointments of former Editors who are willing to help out by handling manuscripts that are submitted during December.

18. Elimination of "tail" papers

In conjunction with the ongoing effort to eliminate the small number of manuscripts that spend an inordinate period awaiting initial decision (i.e., the tail of the distribution illustrated in Fig. 7), the Publications Commission recommends that thresholds should be developed for automatically notifying the handling Editor and Chief Editor of manuscripts that have been languishing. To make better use of Associate Editors in ameliorating delays of hard-to-review manuscripts, am email should be developed that explains their responsibilities.

Appendix A: Editorial Board

Updated June 19, 2019

Anthony J. Broccoli, AMS Publications Commissioner

RED: Retiring PURPLE: Unknown BLUE new

***JOURNAL OF THE ATMOSPHERIC SCIENCES* (12 EDITORS)**

Editor	Position	Term Start	Term End	Current Appointment
Walter Robinson	**Chief Editor**	**01-2015**	**12-2019**	**Initial 2-yr extension**
Olivier Pauluis	Editor	01-2015	12-2019	Initial 3-yr term
Anne Smith	Editor	01-2015	12-2019	Initial 3-yr term
Fotini Katopodes Chow	Editor	09-2016	08-2019	Initial 3-yr term
Zhuo Wang	Editor	06-2017	05-2020	Initial 3-yr term
Sue van den Heever	Editor	06-2017	05-2020	Initial 3-yr term
Sukyoung Lee	Editor	09-2015	12-2020	Initial 2-yr extension
Lou Wicker	Editor	01-2018	12-2020	Initial 3-yr term
Mary Barth	Editor	03-2019	02-2021	Initial 3-yr term
Christopher Rozoff	Editor	01-2019	12-2021	Initial 3-yr term
David Mechem	Editor	01-2019	12-2021	Initial 3-yr term
Lorraine Remer	Editor	01-2013	12-2021	Second 2 yr extension

***JOURNAL OF APPLIED METEOROLOGY AND CLIMATOLOGY* (9 EDITORS)**

Editor	Position	Term Start	Term End	Current Appointment
David A. Kristovich	**Chief Editor**	**01-2012**	**12-2020**	**Third 2-yr extension**
Marwan Katurji	Editor	10-2016	09-2019	Initial 3-yr term
Anita Rapp	Editor	08-2017	07-2020	Initial 3-yr term
Stephen De Wekker	Editor	01-2018	12-2020	Initial 3-yr term
Andrew Ellis	Editor	01-2015	12-2020	Second 2-yr extension
Sandra Yuter	Editor	01-2012	12-2020	Third 2-yr extension
Kathy Klink	Editor	01-2017	12-2021	Initial 2-yr extension
Wen-Chau Lee	Editor	09-2016	08-2021	Initial 2-yr extension
Steve (Qi) Hu	Editor	01-2013	12-2021	Third 2-yr extension

***JOURNAL OF ATMOSPHERIC AND OCEANIC TECHNOLOGY* (7 EDITORS)**

Editor	Position	Term Start	Term End	Current Appointment
Luca Baldini (A)	**CE-Atmos**	**01-2016**	**12-2020**	**Initial 2-yr extension**
William J. Emery (O)	**CE-Ocean**	**01-2016**	**12-2020**	**Initial 2-yr extension**
Tristan L'Ecuyer (A)	Editor	04-2016	12-2019	Initial 9-month extension
Kirsti Salonen (A)	Editor	01-2015	12-2019	Initial 2-yr extension
Denis Volkov (O)	Editor	04-2016	03-2019	Initial 3-yr term
Evan Ruzanski (A)	Editor	01-2016	12-2020	Initial 2-yr extension
Tetsu Hara (O)	Editor	01-2016	12-2020	Initial 2-yr extension

JOURNAL OF CLIMATE (25 EDITORS)

Editor	Position	Term Start	Term End	Current Appointment
John Chiang	**Co-Chief Ed**	**01-2015**	**12-2019**	**Initial 2-yr extension**
Tim Delsole	**Co-Chief Ed**	**01-2017**	**12-2019**	**Initial 3-year term**
Pierre Friedlingstein	Editor	01-2013	12-2019	2nd 2 yr extension
Matt Barlow	Editor	07-2015	12-2020	Initial 3-yr term
Hisashi Nakamura	Editor	01-2016	12-2020	Initial 3-yr term
Michael Evans	Editor	01-2018	12-2020	Initial 3-yr term
Amy Clement	Editor	01-2018	12-2020	Initial 3-yr term
Seung-Ki Min	Editor	01-2018	12-2020	Initial 3-yr term
Ben Lintner	Editor	01-2018	12-2020	Initial 3-yr term
Joel Norris	Editor	01-2018	12-2020	Initial 2-yr term
Mingfang Ting	Editor	07-2014	12-2020	Second 2-yr extension
Mat Collins	Editor	03-2016	02-2021	Initial 2-yr extension
Jason Evans	Editor	04-2016	03-2021	Initial 2-yr extension
Darryn Waugh	Editor	04-2016	03-2021	Initial 2-yr extension
Yi Deng	Editor	08-2016	08-2021	Initial 2-yr extension
Rong Zhang	Editor	09-2016	08-2021	Initial 2-yr extension
Tim Li	Editor	01-2015	12-2021	Second 2-yr extension
Wenhong Li	Editor	01-2017	12-2021	Initial 2-yr extension
Xin-Zhong Liang	Editor	01-2017	12-2021	Initial 2-yr extension
Oleg Saenko	Editor	01-2015	12-2021	Second 2-yr extension
James Screen	Editor	01-2017	12-2021	Initial 2-yr extension
Isaac Held	Editor	07-2019	06-2022	Initial 3-yr term
Baoqiang Xiang	Editor	07-2019	06-2022	Initial 3-yr term
Shawn Marshall	Editor	07-2019	06-2022	Initial 3-yr term
Laure Zanna	Editor	10-2019	09-2022	Initial 3-yr term

Monthly Weather Review (20 Editors)

Editor	Position	Term Start	Term End	Current Appointment
David Schultz	**Chief Editor**	**01-2008**	**12-2020**	**Fifth 2-yr extension**
Dan Kirshbaum	Editor	01-2015	12-2019	Initial 2-yr extension
Ryan Torn	Editor	01-2016	12-2019	Initial 1-yr extension
Pamela Heinselman	Editor	01-2013	12-2019	2nd 2-yr extension
Hugh Morrison	Editor	01-2015	12-2019	Initial 2-yr extension
Hilary Weller	Editor	01-2015	12-2019	Initial 2-yr extension
Elizabeth Satterfield	Editor	01-2018	12-2020	Initial 3-yr term
Chris Weiss	Editor	01-2018	12-2020	Initial 3-yr term
Dan Hodyss	Editor	01-2018	12-2020	Initial 3-yr term
Jidong Gao	Editor	01-2018	12-2020	Initial 3-yr term
Jeff Anderson	Editor	01-2014	12-2020	Second 2-yr extension
Almut Gassmann	Editor	01-2014	12-2020	Second 2-yr extension
Russ Schumacher	Editor	01-2016	12-2020	First 2-yr extension
Matt Eastin	Editor	01-2016	12-2020	First 2-yr extension
Altug Aksoy	Editor	01-2016	12-2020	First 2-yr extension
Ron McTaggart-Cowan	Editor	01-2012	12-2020	Third 2-yr extension
Kristen Corbosiero	Editor	01-2019	12-2021	Initial 3-yr term
Stan Trier	Editor	01-2019	12-2021	Initial 3 yr term
Paul E. Roundy	Editor	01-2012	12-2021	Fourth 2-yr extension
Josh P. Hacker	Editor	01-2011	12-2021	Fourth 2-yr extension

***WEATHER AND FORECASTING* (8 EDITORS)**

Editor	Position	Term Start	Term End	Current Appointment
Gary Lackmann	**Chief Editor**	**08-2017**	**07-2020**	**Initial 3-yr term**
Brian Ancell	Editor	01-2015	12-2019	Initial 2-yr extension
Matt Bunkers	Editor	01-2017	12-2019	Initial 3-yr term
Karen Kosiba	Editor	01-2017	12-2019	Initial 3-yr term
Elizabeth Ritchie	Editor	01-2018	12-2020	Initial 3-yr term
Lynn McMurdie	Editor	03-2016	02-2021	Initial 2-yr extension
Zhaoxia Pu	Editor	10-2016	10-2021	Initial 2-yr extension
Ben Kirtman	Editor	01-2019	12-2021	Initial 3-yr term

***JOURNAL OF PHYSICAL OCEANOGRAPHY* (9 EDITORS)**

Editor	Position	Term Start	Term End	Current Appointment
Jerome Smith	**Chief Editor**	**01-2016**	**12-2020**	**Initial 2-yr extension**
Greg Foltz	Editor	03-2015	12-2019	Initial 2.75-yr term
Joe LaCasce	Editor	03-2017	02-2020	Initial 3-yr term
Paola Cessi	Editor	01-2016	12-2020	Initial 2-yr extension
Nicole Jones	Editor	01-2018	12-2020	Initial 3-yr term
Ilker Fer	Editor	03-2016	02-2021	Initial 2-yr extension
Jody Klymak	Editor	09-2013	12-2020	Second 2-yr extension
Baylor Fox-Kemper	Editor	01-2017	12-2021	Initial 2-yr extension
Karen Heywood	Editor	01-2013	12-2021	Second 2-yr extension

***JOURNAL OF HYDROMETEOROLOGY* (7 EDITORS)**

Editor	Position	Term Start	Term End	Current Appointment
Wade Crow	**Chief-Editor**	**01-2019**	**12-2021**	**Initial 3-yr term**
Andrew Wood	Editor	02-2015	12-2019	Initial 3-yr term
Faisal Hossain	Editor	01-2015	12-2019	Initial 3-yr term
Matt Rodell	Editor	08-2017	07-2020	Initial 3-yr term
L. Ruby Leung	Editor	01-2012	12-2020	Third 2-yr extension
Francina Dominguez	Editor	01-2019	12-2021	Initial 3-yr term
Viviana Maggioni	Editor	01-2019	12-2021	Initial 3-yr term

***WEATHER, CLIMATE, AND SOCIETY* (5 EDITORS)**

Editor	Position	Term Start	Term End	Current Appointment
Henry Huntington	**Chief Editor**	**01-2018**	**12-2020**	**Initial 3-yr appointment**
Shubshyu Saha	Editor	01-2017	12-2019	Initial 3-yr term
Carla Roncoli	Editor	01-2018	12-2020	Initial 3 term
Susan Cutter	Editor	01-2018	12-2020	Initial 3 yr term
Walker Ashley	Editor	01-2019	12-2021	Initial 3-yr term
Tanya Spero	Editor	01-2019	12-2021	Initial 3-yr term

***EARTH INTERACTIONS* (3 EDITORS)**

Editor	Position	Term Start	Term End	Current Appointment
Rezaul Mahmood	**Chief Editor**	**01-2010**	**12-2020**	**Second 2-yr extension**
Joseph Santanello	Editor	01-2015	12-2019	Initial 3-yr term
Xiaoyang Zhang	Editor	10-2017	11-2020	Initial 3-yr term

MONOGRAPHS (1 EDITOR)

Editor	Position	Term Start	Term End	Current Appointment
Greg McFarquhar	Chief Editor	01-2015	12-2019	Initial 2-yr extension

***GLOSSARY OF METEOROLOGY* (1 EDITOR)**

Editor	Position	Term Start	Term End	Current Appointment
Ward Seguin	Chief Editor	01-2018	12-2021	Initial 3-yr term

OTHER COMMISSION MEMBERS (4)

Editor	Position	Term Start	Term End	Current Appointment
Bob Rauber	Past Commissioner	01-2019	12-2021	Initial 3-yr term
Vanda Grubišić	At large	01-2016	12-2020	Initial 2-yr extension
Zhuo Wang	At large	01-2018	12-2020	Initial 3-yr term
Pamela Heinselman	At large	01-2019	12-2021	Initial 3-yr term

Appendix C: Status of articles for 100 year monograph (as of June 23, 2019)

Title: A Century of Progress in Atmospheric and Related Sciences: Celebrating the American Meteorological Society Centennial

0. **PREFACE Greg M. McFarquhar and Robert M. Rauber**
1. **AMERICAN METEOROLOGICAL SOCIETY: 100 YEARS OF SUPPORTING THE SCIENTIFIC COMMUNITY Keith L. Seitter, Jinny Nathans, and Sophie Mankins (Published)**
2. **100 YEARS OF PROGRESS IN ATMOSPHERIC OBSERVING SYSTEMS, Jeffrey L. Stith, Holger Vömel, Matthias Steiner, Paul L. Smith, Donald Lenschow, Darrel Baumgardner, Wen-Chau Lee, Peter Pilewskie, Julie Haggerty, and R. Michael Hardesty (Published)**
3. **100 YEARS OF PROGRESS IN OCEAN OBSERVING SYSTEMS Russ E. Davis, Lynne D. Talley, Dean Roemmich, W. Brechner Owens, Daniel L. Rudnick, Robert Weller, John Toole, Michael J. McFadden, and John A. Barth (Accepted)**
4. **SATELLITES SEE THE WORLD'S ATMOSPHERE S.A. Ackerman, S. Platnick, P.K. Bhartia, B. Duncan, T. L'Ecuyer, A. Heidinger, G. Skofronick-Jackson, N. Loeb, T. Schmit, and N. Smith (Published)**
5. **FIFTY YEARS OF SATELLITE REMOTE SENSING OF THE OCEAN Lee-Lueng Fu, Tong Lee, W. Timothy Liu and Ronald Kwok MINOR REVISION (Published)**
6. **100 YEARS OF PROGRESS IN UNDERSTANDING THE GENERAL CIRCULATION OF THE ATMOSPHERE Isaac Held (Published)**
7. **100 YEARS OF THE OCEAN GENERAL CIRCULATION Carl Wunsch and Raffaele Ferrari (Published)**
8. **100 YEARS OF PROGRESS IN UNDERSTANDING THE DYNAMICS OF ATMOSPHERE-OCEAN VARIABILITY Dave Battisti (Accepted)**
9. **100 YEARS OF PROGRESS IN UNDERSTANDING EARTH'S MIDDLE ATMOSPHERE Mark Baldwin (Major Revision, awaiting resubmission)**
10. **100 YEARS OF PROGRESS IN BOUNDARY LAYER METEOROLOGY Margaret A. LeMone, Wayne Angevine, Christopher S. Bretherton, Fei Chen, Jimy Dudhia, Evgeni Fedorovich, Kristina B. Katsaros, Donald H. Lenschow, Larry Mahrt, Edward G. Patton, Jielun Sun, Michael Tjernström, and Jeffrey Weil (Accepted)**
11. **100 YEARS OF PROGRESS IN GAS-PHASE ATMOSPHERIC CHEMISTRY RESEARCH Timothy J. Wallington, John H. Seinfeld, and John R. Barker (Published)**
12. **100 YEARS OF PROGRESS IN CLOUD PHYSICS, AEROSOL AND AEROSOL CHEMISTRY RESEARCH Sonia Kreidenweis and Markus Petters (Major Revision, resubmitted and under re-review)**
13. **100 YEARS OF WEATHER AND CLIMATE MODEL DEVELOPMENT Dave Randall, John Thuburn, Robert Pincus, Hugh Morrison, Andrew Gettelman, Gokhan Danabasoglu, Stephen M. Griffies, Cecilia Bitz, Scott Denning, Peter Gent, and Peter Lynch (Accepted)**
14. **100 YEARS OF PROGRESS IN FORECASTING AND NWP APPLICATIONS Stan Benjamin, John Brown, Gilbert Brunet, Peter Lynch, Kazuo Saito MINOR REVISION (Published)**
15. **100 YEARS OF RESEARCH TO UNDERSTAND EARTH'S CLIMATE AND CLIMATE FORCING V.**

Ramaswamy (Major Revision, awaiting resubmission)

16. 100 YEARS OF PROGRESS IN TROPICAL CYCLONE RESEARCH Kerry Emanuel (Published)
17. 100 YEARS OF PROGRESS IN EXTRATROPICAL CYCLONE RESEARCH David M. Schultz, Lance F. Bosart, Brian A. Colle, Huw C. Davies, Christopher Dearden, Daniel Keyser, Olivia Martius, Paul J. Roebber, W. James Steenburgh, Hans Volkert, and Andrew C. Winters (Published)
18. 100 YEARS OF RESEARCH ON MESOSCALE CONVECTIVE SYSTEMS Robert A. Houze Jr. (Published)
19. 100 YEARS OF SEVERE CONVECTIVE STORM SCIENCE AND OPERATIONS Harold Brooks, Chuck Doswell, Bogdan Antonescu, Ernani Nascimento, Xiaoling Zhang, Ergo Tochtmoto, Alexander Chernokulsky, David Sills, Barry Hanstrum, Ernani De Lima Nascimento, and Brad Barrett (Accepted)
20. 100 YEARS OF PROGRESS IN NON-CONVECTIVE MESOSCALE METEOROLOGICAL RESEARCH Dave Kristovich (Accepted)
21. 100 YEARS OF PROGRESS IN MOUNTAIN METEOROLOGICAL RESEARCH Ronald B. Smith (Waiting for resubmission; Minor revision)
22. 100 YEARS OF PROGRESS IN POLAR METEOROLOGY John E. Walsh, David A. Bromwich, James E. Overland, Mark C. Serreze and Kevin R. Wood (Published)
23. 100 YEARS OF PROGRESS IN APPLIED METEOROLOGY Part I Basic Applications Sue Ellen Haupt, Robert M. Rauber, Bruce Carmichael, Jason C. Knievel, James L. Cogan and Pamela A. Clark (Published)
24. 100 YEARS OF PROGRESS IN APPLIED METEOROLOGY Part II Applications that Address Growing Populations Sue Ellen Haupt, Steven Hanna, Mark Askelson, Marshall Shepherd, Mariana A. Fragomeni, Neil Debbage, and Bradford Johnson (Accepted)
25. 100 YEARS OF PROGRESS IN APPLIED METEOROLOGY Part III Additional Applications Sue Ellen Haupt, Branko Kosovic, Scott W. McIntosh, Fei Chen, Kathleen Miller, Marshall Shepherd, Marcus Williams, Sheldon Drobot (Published)
26. 100 YEARS OF PROGRESS IN HYDROLOGY Christa Peters-Lidard (Accepted)
27. SOCIAL SCIENCES AND CLIMATE CHANGE Maria Carmen Lemos, Hallie Eakin, Lisa Dilling, and Jessica Worl (Published)
28. EPILOGUE: THE FUTURE Greg M. McFarquhar and Robert M. Rauber

Vision and Recommendations for AMS
Curation and Communication of Research in the 21st Century
An AMS Centennial Committee White Paper

1. Committee Charge

The Task Force charge was to look to the future, where information will be transmitted in ways only beginning to take root, and make recommendations as to how the AMS should effectively communicate and curate research. Technology is driving rapid evolution in methods of information dissemination. To remain relevant, the AMS must operate in this new and changing environment—serving its members and the broader society, and ensuring that the high standards of research communication for which it is known are never compromised. The AMS must continually be at the forefront of integrating new technologies and best practices for curating and communicating scientific research.

2. Committee Membership

- Bob Rauber, Committee Chair, Professor, University of Illinois at Urbana-Champaign, Past Publication Commissioner, AMS
- Allison Langham-Putrow, Scholarly Communications and Engineering Liaison Librarian, University of Minnesota
- Carolyn Bishoff, Physics, Astronomy, and Earth Sciences Librarian, University of Minnesota
- Megan Valcour, Publications Web Team and Peer Review Support Assistant, American Meteorological Society
- Lisa Michaels, Forecaster, KFVS TV, Cape Girardeau, MO
- Melissa Peterson, Senior Scientist, Avmet Applications, Inc.
- Gary Lackmann, Professor, North Carolina State University, Chief Editor, Weather and Forecasting, AMS Council Member
- Nate Johnson, Director of Weather Operations, NBC Owned Television Stations
- Marshall Shepherd, Professor, University of Georgia, Past President AMS

Additional information was provided by

- Matthew Mayernik, Project Scientist & Research Data Services Specialist, NCAR Library
- Anthony Broccoli, Professor, Rutgers University, Current Publication Commissioner, AMS

3. Current Research Communication and Curation within the AMS

The AMS takes pride in the scientific integrity of the material it publishes and provides to the public. The issue of maintaining integrity during the ongoing technological revolution is central to the AMS mission, and adapting to the revolution in the way information is published, stored, and scrutinized must be done with great care. The AMS should raise the notion of information curation to a core competency common across all AMS functions. In doing so, the society should integrate multiple approaches to information integrity (e.g., peer review, shared knowledge, certifications, best practices) to build comprehensive processes and tools for achieving and maintaining integrity. The expectation moving into the future is that AMS will be viewed within and beyond the community it serves as a leader in applying current information integrity standards, innovating new standards, and sharing developments with partners and the broader community. Currently, research, and recommendations based on research, are communicated within the AMS using the following eleven venues:

1) *Scientific Journals*: The AMS hosts nine peer-reviewed scientific journals. Journal articles for all AMS historical issues are available online. Aside from universal incorporation of color figures following the

elimination of page charges for color in 2010, the journal format (the way the information has been communicated) has not evolved significantly over the last century. Journals are available on paper for subscribers who want paper. Costs for printed versions of journals are set so that those who subscribe to print versions bear the costs of printing. As of 2019, journal articles are embargoed for one year unless the author pays a fee for immediate open access.

2) *Bulletin of the AMS (BAMS)*: The Bulletin of the AMS is the primary communication vehicle of the society and is sent to all members. The Bulletin is published in paper form and online. BAMS also publishes scientific research articles, and the annual State of the Climate. The Centennial Committee has a separate task force evaluating the future of BAMS. Our committee did not include BAMS in the discussion of communication and curation, deferring that to the BAMS task force.

3) *Scientific Meetings*: Research is communicated through talks and posters at scientific meetings. The archiving of this information has evolved from conference preprint volumes (which were discontinued) to archives of presentations and recordings of talks. AMS currently contracts Conference Exchange[2], which records conference presentations and hosts the recorded content on their servers. Poster presentations, which can constitute a significant fraction of presentations, currently are not archived.

4) *Community Forums:* The AMS has recently established community email forums for communications between members, or within committees, commissions, and the Council. These require AMS membership, and are accessed using a login and password.

5) *AMS Soundings*: Soundings is an emailed news and information service sent to members.

6) *Social Media*: The AMS posts information on Facebook, Twitter, Linked-In, and videos on a YouTube channel[3].

7) *Website*: The AMS maintains a website with information about membership, publications, education and careers, meetings and events, and public policy. The website provides access to the information in (1) through (5) above.

8) *Statements*: The AMS periodically issues statements on topics that fall within the scope of AMS expertise as a service to its members, and in fulfillment of its larger responsibilities to human society. These are available on the AMS website[4].

9) *Position Letters*: The AMS Council sends letters to policy makers stating the AMS position on issues of concern. These public letters are available on the AMS website[5].

10) *Policy Program Studies*: The AMS, as part of its "News and Announcements" occasionally publishes Policy Reports, which appear on the AMS website under its Policy Program tab on the AMS website[6].

[2] http://confex.com/
[3] https://www.youtube.com/user/ametsoc
[4] https://www.ametsoc.org/ams/index.cfm/about-ams/ams-statements/statements-of-the-ams-in-force/
[5] https://www.ametsoc.org/ams/index.cfm/about-ams/news/
[6] https://www.ametsoc.org/index.cfm/ams/policy/

11) *The AMS newsroom*,[7] provides links to atmospheric news (links to stories in news headlines), news releases (newsworthy items generated from within the AMS), meeting information, statements, position letters, and connections to experts. Atmospheric news is distributed via email to subscribers[8], who do not have to be members.

4. A Vision for the Future of Scientific Journals

The future of scientific journals and delivery of journal content has been debated since the internet became available. Problems with the current scholarly publishing model are significant, and digital tools are multiplying. However, traditionally-structured journals remain dominant as the AMS enters its next century. Proposals to radically (or modestly) reinvent journal publishing models have been common since the 1990s, along with predictions of the death of traditional journals (Odlyzko 1995[9]; Kling & Callahan 2003[10]). Journals have switched to electronic form, but otherwise they largely remain the same as paper journals. It is important to reflect on why this is. Within the information sciences, a few scholars have analyzed these issues in some detail (Borgman 2007, chap 4[11]; Van de Sompel et al 2004[12]). They point out that the scientific record must fulfill several key functions in order for scholarship to thrive, including registration, certification, legitimization, dissemination, access, preservation, and curation. Traditional journals, in concert with libraries, universities, and other research institutions, fulfill these functions well. Future technologies or processes must be considered in the context of how any new approach would fulfill these core functions of scholarly communication. It's also fair to ask whether our future scientific communication will be "held back" by traditional ideas of what libraries have been/continue to be. If there is a broader shift in forms of communication (text, images, video, code, etc.), what new kinds of "libraries" will there be to archive this information, and how will that relate to how the AMS archives information.

In this section, we present options that have potential to enhance AMS journal content. The AMS Publications Commission and Council should evaluate these while considering the following questions:

1) Will a proposed expansion of content raise the visibility of AMS Publications in a way that makes AMS journals more attractive to authors or useful to readers?
2) Will the commitment of time and effort required from authors, editors, reviewers, and AMS staff be increased, and if so, will it impact the ability of the journals to continue to engage a volunteer workforce?
3) Will there be unintended consequences of any changes? For example, could the AMS create a venue for content distribution that unintentionally hosts vulgar exchanges such as those common on social media. These types of exchanges have been uncommon in other fields that have tried open peer review, but topics with fringe followings such as climate change might entrain people who would engage at an unprofessional level.
4) What are the financial costs of pursuing any specific avenue for distributing content?

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[7] https://www.ametsoc.org/ams/index.cfm/about-ams/news/

[8] https://www.ametsoc.org/ams/index.cfm/about-ams/news/sign-up-for-news-updates/

[9] Odlyzko, A. M. (1995). Tragic loss or good riddance? The impending demise of traditional scholarly journals. International Journal of Human-Computer Studies, 42(1), 71–122. https://doi.org/10.1006/ijhc.1995.1004

[10] Kling, R. and E. Callahan. (2003). Electronic journals, the internet, and scholarly communication. Annual Review of Information Science and Technology. 37: 127-177. https://doi.org/10.1002/aris.1440370105

[11] Borgman, C.L. (2007). Scholarship in the Digital Age. Cambridge MA: MIT Press.

[12] Van de Sompel, H., Payette, S., Erickson, J., Lagoze, C., & Warner, S. (2004). Rethinking scholarly communication. D-Lib Magazine, 10(9). https://doi.org/10.1045/september2004-vandesompel

Within these constraints, the committee considered the following possible advancements in journal content delivery:

Animation: AMS journals are currently static. Attend any conference and it is immediately clear that science is communicated effectively with animations, particularly our science, which focuses on the evolving atmosphere and ocean. Animations are necessary to communicate time evolution, something critical in geoscience. Across most journals, AMS only offers one way to have animations in the permanent scientific archive: journal supplements that are rarely accessed. Two exceptions are BAMS and Earth Interactions (EI). The animation capability for EI has only been rarely used by authors, and the journal itself has a low submission rate. Will AMS journals be left behind when another society, or perhaps a private company, creates the on-line journal that supports animations? The AMS should actively consider how to lead the way in incorporation of visual animations into journal online content, and developing reviewer guidelines for evaluating them, while recognizing the challenges associated with archiving this type of material.

Data and Code Curation: The future is arriving when scientists may be required to publish computer codes (e.g., through tools like Jupyter notebooks[13], and data. Scientific journals, under mandates from government, or even as a general practice without government regulation, may offer to include, or may even require data, codes, and/or metadata to accompany an article. The current trend is toward more inclusiveness. The AMS should stay abreast of these trends and stay competitive with journals that implement them. However, any strategy should be as language- and platform-agnostic as possible. Python, for example, is the language du jour now, but if the brief history of computer science has taught us anything, it is that languages evolve and are replaced with some regularity.

Public Access to Research: The AMS is already implementing ways to increase public access to the science reported in AMS journals. The AMS has already contracted with Kudos[14], a private service that enables authors to provide a "plain language" description of their research published in scientific journals so that the public can become more aware of, and better understand the science conveyed in their papers. Kudos also provides tools for authors to promote their articles, primarily via social media. Authors of AMS publications began using Kudos in 2017. So far, 555 AMS authors registered on Kudos, there have been 15,000 Kudos page views, and over 3,000 author actions (authors writing summaries and sharing them via Kudos to social media, email, etc.). There have been 300 click-throughs to journal article DOIs from Kudos. The AMS is also implementing publishing a peer-reviewed "significance statement", or plain-language abstract, that would be part of the article itself. Both approaches promote a broader public understanding of AMS published research. The plain language abstract has not been implemented at the time of this writing, but should be sometime in 2020. Like all AMS abstracts, these would be openly accessible. An ambitious possibility is to host online presentations of the published research by authors. A video presentation, similar to the current conference presentations archive, could be tied to the article online, where the author presents the work. These could be optional, have restrictions (such as a 15 minute time limit), and be supplied by the author. A key challenge in implementation will be to establish and implement standards and determine how to enforce compliance. A clear disclaimer would be included that the material presented was not subject to peer review would be necessary. Another

[13] The value of Jupyter or other notebooks in scientific papers has been both oversold and questioned. See https://www.theatlantic.com/science/archive/2018/04/the-scientific-paper-is-obsolete/556676/ and: https://www.oliversherouse.com/2018/04/17/notebooks_arent_papers.html

[14] https://www.growkudos.com/about/

approach using social media is to post abstracts. Potential unintended consequences of using social media should be carefully considered before taking any action.

Peer Review Process: Currently a submission to an AMS journal undergoes anonymous review. The submission is not visible to the public until it is accepted as an article, and the reviews remain inaccessible to anyone aside from the editor, reviewers, and authors. Other models exist[15], such as "interactive public peer review", and may include immediate posting of a submission, a public comment period, posting of the reviews, and posting exchanges with, or responses from the authors. Software[16] already allows for a "conversation" alongside an article. The AMS publication commission should carefully evaluate these options and whether they would serve AMS authors and subscribers better than the current system.

Access Barriers: One of the goals of the AMS in the next century is to fully engage meteorological societies in other countries. This effort has been underway with formal agreements with the Chinese, Australian, Indian, and Canadian Meteorological Societies. In line with this international focus on the future, the AMS will continue to be confronted with language barriers in access to its publications. The concept of publishing abstracts in foreign languages indeed was investigated in 2017, but the costs, complexities, and feasibility of such an endeavor at that time did not favor any action. In the long term, this may be revisited as translation technology improves. In fact, as translation tools for public use improve, this may be something that readers may be able to do for themselves in the future. A second barrier exists for visually impaired individuals, whether color blind, or unable to see[17]. The AMS should, as a minimum, provide guidelines to authors on compliance to colorblindness standards, and set as a goal, full compliance with Section 508 of the Rehabilitation Act. Addressing these issues to provide broader access is an important consideration for the future of AMS publications. Finally, the AMS is making inroads toward making online information portable. The AMS is close to implementing true MathML online that will allow screen readers to parse equations in articles. Once that is fully in place, the publications department plans to investigate doing a similar fix to allow figures and tables to be machine readable as well.

There are two significant issues with implementing any of these advancements.

Open Access and Business Models: Currently, funders, especially in Europe, are mandating public access to scientific information. Plan S is an initiative co-signed by major European funding agencies, the Wellcome Trust, and the Gates Foundation. It requires that research funded by public grants must be published in open access journals. Plan S does not consider journals that charge both a subscription fee and a separate fee for open access for a particular article ("hybrid" journals) to be compliant. However, authors are permitted to publish in a hybrid or subscription journal if they keep their copyright and also deposit a copy of the manuscript in an open access repository (with a particular license, CC-BY), so organizations like AMS may need to amend their author agreements if they don't already allow this. In 2018, 54% of submissions to AMS journals came from foreign authors. Many of these authors are from the European Union and those funded by Plan S signatories will be subject to these restrictions. There is additional pressure to move publications and publishing agreements toward open access. The committee believes open access is inevitable, and should be done as soon as possible by the AMS.

[15] https://peerj.com/;
https://www.atmospheric-chemistry-and-physics.net/peer_review/interactive_review_process.html

[16] https://web.hypothes.is/publishing/
https://web.hypothes.is/blog/transparent-peer-review/

[17] See US Government Section 508 for some information on standards https://www.section508.gov/

Open access is fine, but then how does the AMS pay for publishing? For that matter, how can we make sure that the AMS can continue to exist at all? In general, all societies will need to review their financial models to see what makes sense in the future—and use technology where possible to reduce the costs of publishing[18]. For a lot of societies, like the AMS, publishing revenue supports the work of the rest of the society, and revenue from other sources is getting harder to maintain. There are alternative funding models that AMS could consider in the next 10-20 years or beyond, but each has drawbacks:

Consortium Models: SCOAP3 is a consortium of publishers who publish particle physics research. They transitioned their subscriptions to tiered "memberships" that institutions voluntarily pay into to make publications free to readers. ICPSR, a consortium of institutions that supports a data archive, is another example of this model. With any consortia model, there's a freeloader issue, of course, and membership-like models make long-term sustainability more uncertain. Institutions who would be big users could opt not to participate. We all want AMS to be around for another 100 years and librarians have noted sustainability issues with "donor" or "consortium" models.

PeerJ is an open access publishing platform with an individual and institutional membership model. Authors pay some membership fee and can publish articles without paying individual charges. Libraries still pay subscriptions but the authors get a direct benefit provided all authors on the article are from member institutions.[19].

This issue is one that the committee has no clear path to recommend. It impacts all aspects of the AMS, and may ultimately make many of the recommended future changes above unaffordable to implement. This is a critical issue for the future of the Society.

Sustainability of Content and Long-term Preservation of AMS's Legacy: Scientists and the public want immediate access to research. Librarians think about how to preserve and make materials accessible 5, 50, or even 100 years in the future. Sustainability often relies on partnerships. The AMS must always have a plan for protection and preservation of articles and associated content. Unfortunately, homegrown infrastructure is difficult to maintain. What non-profit, non-commercial options exist? Joining an initative such as *CLOCKSS* or *Portico* is one approach. However, it is much harder to archive video, web conference recordings, animations, and dynamic Jupyter notebooks. There may security issues with these types of materials. AMS in the future may need to partner with another repository to preserve other publication materials; however, if a repository does not already exist, the AMS might consider pursuing a long-term partnership with other organizations in the field like NCAR or DataONE. Either way, the materials in the "article of the future" need to be protected when AMS switches web platforms or publication platforms, something that may happen multiple times over the next 100 years. Partnerships with digital preservation specialists and librarians will be important. The AMS should also evaluate whether its content could survive catastrophe. Catastrophies come in many forms, from the immediate closing and bankruptcy of a company hosting content, to a natural disaster, flood or fire, to human conflict. In the past, information on paper hosted in world libraries had high survival potential. Will digital content survival be as fortunate? Time will tell. Engaging with digital preservation specialists to fully appreciate the issues at play is critical.

[18] An example of what a small, open access press is doing can be found at: https://www.ubiquitypress.com/site/publish/#article-processing-charges

[19] Details on PeerJ charging are found here https://peerj.com/pricing/ and individual memberships here https://peerj.com/pricing/#apc-membership-pricing

5. A Vision for the Future of Scientific Meetings

AMS meetings, both the annual meeting and specialized meetings held at other times of the year, are both popular and successful. The AMS has made a tremendous effort to provide the content of these meetings online and make them freely available to everyone by posting the complete program and all talks (where the speaker gives permission), including PowerPoint slides or PDFs and audio of the speakers.

The committee considered the following possible advancements to enhance the meeting experience and provide broader access to AMS meetings:

Complete Digital Access: Digital access to AMS Annual and Specialty Meetings is possible, but threatens meeting revenue. The committee envisioned a future in which meetings could be completely digital and fees would pay for digital access. The vision is not for a simple subset of meetings in a *GoToMeeting* format, but an actually digital conference room with virtual access to participants that have purchased a digital pass. This may not be possible in the present, but will be in the future as more and more companies and professional societies seek to lower costs for their members who either cannot travel, cannot afford travel, or have students that cannot travel because of limited resources. This will also open the door to broader participation overall. For example, virtual conferences would be a way for people from other countries to become more involved. Traveling to the U.S. is expensive, and for some countries the visa process is so complicated that it is nearly impossible. There are precedents. For example, the National Weather Service has a 'digital conference room' when major events happen where people can view the current information on an upcoming weather event. NWS officials show present a live video format. OpenCon (https://www.opencon2018.org/) is a small conference that is livestreamed and hosts "satellite events." This opens it up to people who were not awarded scholarships, were unable to provide their own funding to travel internationally, or were unable to obtain the necessary visa and travel permits to enter the host country. The OpenCon livestream is popular even with substantial time differences between participants around the world. The satellite events allow people to participate in discussions on the broad issues but in a more local context. Similar technology could provide a positive chance for members and interested individuals to view AMS meetings/presentations in the future from a different location. It may be possible to have some 'fee' to virtually attend the conference to create revenue.

Poster Presentations: A significant fraction of the presentations at AMS conferences are in poster format. Presently, only abstracts for posters are archived online. These abstracts are often dated, since they are submitted many months before the meeting, and the research often advances in the interim. Authors could be given the option of uploading the poster as a PDF file, and the PDF file could be retained as part of the online archive if the author gives permission, similar to what is done for presentations. There may be other ways in the future rather than uploading a PDF file. One of the issues with PDF files that current technology faces is having the download bandwidth to physically download PDF files on mobile devices. This can be slow, and files also clutter the device's memory. New services for digital posters are now available.[20] Partnerships with these services may enhance participation in AMS meetings. The AMS should also remain open to the possibility that "poster presentations" may not just be posters in the future. We have already seen some presenters bringing laptops or iPads to conduct live demos or show animations or other features that would not translate well to a printed poster. Attaching PDFs might be a good first step, but whatever solutions that come for everything else would also need to apply for poster and other perhaps not-yet-conceived presentation formats. In pursuing this approach, care would be required to ensure that archival of posters would not prevent the subsequent publication of the poster content.

[20] https://ipostersessions.com/

Access Barriers: As with publications, the AMS needs to think carefully about physical and language barriers in meetings in the coming century as our population diversifies. Enhancing the experience for all attendees is a worthy goal.

6. A Vision for the Future of AMS Communications

Current Communication Venues beyond Publications and Meetings: The AMS communicates to its members via BAMS, its website, email, and social media. Communications to the public and policymakers also occurs via the AMS website, formal statements, position letters, Congressional briefings, social media and news releases. Statements that fall within the scope of AMS expertise appear on its website. Policy Reports appear on the AMS website under its Policy Program. The AMS website hosts information about membership, publications, education and careers, meetings and events, and public policy.

The AMS recently implemented a new strategy using email forums to facilitate communication within the membership and within specific committees and commissions. The AMS also provides news information to its members through email via AMS Soundings. The AMS also uses Twitter, Facebook, and InDesign pages to provide news and information about AMS programs, publications, meetings, events, awards, elections, deadlines, etc. Concerning research communication, Tweets include announcements about selected journal articles with broad appeal as well as presentations of interest at the Annual Meeting. One intention of the forthcoming redesign of BAMS is to bring more research-related content to AMS social media. The Front Page blog includes posts about AMS programs and news as well as about current events (e.g., hurricanes, tornadoes, air quality) and their connection to research in AMS publications and meetings.

Future Directions in communications:

There are two audiences for AMS communication: Experts, including academics, research scientists and professionals, and non-experts, and members of the public interested in weather, water and climate. To be relevant, the AMS needs to engage both audiences. The ideas below primarily target the latter group. For the latter group, weather and climate are very topical; folks care when they want to but don't when it's not on their radar. AMS can curate the wealth of content it has so that quality, *public-facing* material gets surfaced at the right time. Look toward NASA's Solar System Ambassador Program as a potential model for a weather ambassador program. Examples of communications venues that can be pursued include:

AMS Statements: AMS statements are currently developed and vetted through a very detailed process[21] that can take years to update in some cases. Some topics do not require updates often, but others, where research evolves rapidly, can become dated well before they are considered for renewal. One possibility is to make statements wiki-like to update more frequently and dynamically. Careful, considered review of their content is essential, but the AMS should explore ways to keep statements relevant in the future of rapidly evolving research.

AMS Documentaries, Webinars, and Video Presentations: There are various aspects of AMS work that could be put onto the AMS YouTube channel, such as public-facing presentations, or scientific informational

[21] https://www.ametsoc.org/ams/index.cfm/about-ams/ams-statements/guidelines-for-statements-of-the-ams/

presentations. The committee noted that a Jim Hansen presentation of one of his journal papers[22] is approaching 100,000 views on YouTube. This no doubt exceeds the number of people who have actually read the journal article. Katharine Hayhoe's "Global Weirding" series is a second example of ways to communicate ideas. Periodicity is important so material appears regularly, and the public grows to anticipate new releases. Weekly weather discussions, or explanations of weather subjects might be topics the AMS could pursue.

Examples might include:

- A "documentary" about a field program, interviews with the scientists, what tools they use, what science questions they seek to answer;
- A public-facing presentation of an AMS journal article that would be of societal or public interest (e.g., extreme event research, climate change)
- Presentations with interpretation of novel remote sensing imagery, such as from the new GOES satellites, polarimetric radar, etc.
- Presentations with interpretation of sophisticated numerical model simulations, of the Earth system, of a severe storm, or a large-eddy simulation; perhaps some as supplementary material accompanying a journal publication.
- "TED-type" talks, presenting the exciting science of AMS members in a way that draws in a broader audience.

There will be production cost to make these products appear professional, and perhaps AMS could partner more strongly with a broadcast arm of the Society to accomplish this. We note that any "pivot to video" must be approached carefully[23]. The AMS should only invest in video if the AMS has people (or is willing to pay for people) to make high quality content. Video should enhance, but never replace, textual material.

AMS Media Training: Many members of the AMS are trained to follow the scientific method, write scholarly publications, and engage in scientific meetings. The methods of science knowledge sharing in the scholarly community is often counterproductive for effective communication in public, media, or policy formats. AMS members generally lack formal training on how to interact with the media. Weather and climate related topics continue to dominate media headlines, which requires increasingly more interaction with members of the AMS community. Media training is required to provide our members with the techniques, experience, and knowledge to navigate the rapidly changing media landscape. Specifically, such training would:

- increase awareness of strategies to use for on-camera, print, and social media activities,
- provide recommendations for handling uncertain or difficult questions from the media,
- expose members to effective ways to communication science publicly,
- offer experience with hands-on or simulated media opportunities,
- train members in how to navigate the important world of social media, and
- establish a supplemental training program for private, government, and academic sector members.

[22] https://www.youtube.com/watch?v=JP-cRqCQRc8

[23] https://blog.hubspot.com/marketing/pivot-to-video-is-misguided
https://www.vanityfair.com/news/2018/10/was-the-medias-big-pivot-to-video-all-based-on-a-lie
https://slate.com/technology/2018/10/facebook-online-video-pivot-metrics-false.html

The AMS risks becoming stagnant and irrelevant if its members and communication strategy remains anchored in the modes of the past. Media training is one way to move the Society into the next 100 years.

AMS Professional Training: Perhaps AMS can promote training and resources like the CBM/Seal for folks who want to share the science but who aren't on TV or working as consulting meteorologists (CCM). The AMS can leverage the educational materials it already has.

AMS TV: In the next 5 to 20 years, TV will not be consumed the way it is now, but some type of AMS streaming, digital or You Tube Channel could be a great way to feature AMS talks and material. NASA TV, and its value to NASA over the years, provides an example of how it could be done.

AMS Website, Podcasts, and/or Smartphone Apps specifically targeted for public, rather than membership consumption: Exposure to the AMS could be enhanced by creation of a user-friendly website, podcasts, and/or smartphone apps that can be easily understood by the average person that is not familiar with the science behind weather. There are lots of people who are fascinated by weather and love to follow public figures to learn about it, but they do not really understand even the basics. This website or app has to have visual stimulation such as pictures, web videos, and presentations to keep viewers engaged. This information can cover anything from current events going on across the country, new weather findings, to past weather information. Think of this as the equivalent of Weatherfest on the web. Any easy way to navigate to find topics (winter weather, tornadoes, etc.) should be part of the site. The AMS cannot host advertisements without threatening its non-profit status. However, the AMS can advertise itself. Strategically placed ads could be made to promote the AMS public website or app, possibly on the Weather Channel, or on a banner on TV weather broadcasts.

AMS Social Media Presence: Posts on social media (e.g., Twitter, Facebook, LinkedIn) by the Society have two purposes:

1) reaching outward to non-members (which may include weather enthusiasts, news organizations, the general public, and possibly policy makers), and
2) reaching inward to provide specific information to members.

The AMS has excellent tools to reach inward without social media, specifically, member email forums. Social media should be used primarily to reach outward to non-members. Of the currently 43,000 individuals who have liked the AMS Facebook page and follow the AMS, the vast majority are not members. The vast majority of followers on Twitter are also not members. The AMS social media platform should not be used to talk to members. The AMS should create a committee, as part of the STAC commission for example, to assess and establish what its specific goals are in using social media. Currently the AMS Facebook page is very meteorologist specific, highlighting conferences, and webinars, targeted with information valuable to members, does not contain much material targeted at general masses. The AMS should consider ways to increase public outreach via social media, for example, with, a "Wild Weather Blog", or an "Ask a Meteorologist" blog. A careful assessment of how to use social media could spur membership. The AMS membership currently requires credentialing, effectively excluding broad public participation that could occur with effective use of social media. The AGU, for example, does not require credentialing. An individual sends in 50 dollars and becomes a member. Can the AMS engage social media to increase membership? Once members, individuals would receive the newly reworked and streamlined BAMS, which has the potential to engage those new members and maintain their membership.

AMS News Releases: The AMS currently does press releases on its own occasionally, but usually when it does releases, it is in conjunction with the author's home institution and at their request. The AMS has a mechanism on its website for new releases, but it appears to be ineffective, based on the existing press release page on the AMS website.[24] The website as of March 2019 listed four news releases in 2017 and five in 2018. Nearly all were about changes in commissioners, chief editors of journals, or other appointments. Only two were not of this nature. With the volume of great research coming from the AMS, press releases about research could be a weekly occurrence. These press releases will be more effective when plain language abstracts are introduced.

Professional Pages or Links: AMS could host pages or links to professional pages for its members. Such links would help younger members connect to the weather and climate professional community.

[24] https://www.ametsoc.org/ams/index.cfm/about-ams/news/