Manuscript Submission Requirements Checklist

Correspondence to the Editor-in-Chief should be addressed to:
Professor Julie B. Zimmerman, Editor-in-Chief, ES&T
EIC@est.acs.org

- Cover letter
- Title: Titles should be clear and concise; they must match between manuscript file and electronic submission.
- Author list with affiliations: must match between electronic entry and manuscript file
- Abstract
- Manuscript File: Clean with no highlighting or comments and all changes accepted.
- (Highly encouraged) Have a colleague in another field read as test for accessibility.
- Tables/Schemes/Figures: Text should be clear and legible, with fonts no smaller than 8 pt.
- Figures: must be labeled sequentially and match numbered references in article (manuscript and Supporting Information). Where appropriate, label all subsections by letter.
- Supporting Information (if any) must be included in the electronic submission.
- Table of Contents Graphic
- References: no specific format is required, but it must be sufficient to aid referees in their reviewing duties.

Journal Scope

*Environmental Science & Technology* (ES&T) is an impactful environmental science and technology research journal that aims to be transformational and direction-setting publishing rigorous and robust papers for a multidisciplinary and diverse audience of scientists, policy makers and the broad environmental community. For more than 50 years, *ES&T* has been a foundational focus for thought-leading, policy-changing contributions and will continue to serve as the home for significant, broadly relevant, and generalizable research that serves to inform decision-making. The journal advances rigorous scholarship on complex environmental phenomena, particularly with respect to fate, transport, and transformation in natural and engineered systems, while simultaneously facilitating the solution of critical environmental problems. In addition to novelty and significance of research, *ES&T* considers the relevance of submitted manuscripts to its broad readership.

*ES&T* has been at the forefront of the environmental science and technology movement, serving the environmental community as a top-tier, respected, reliable and pivotal venue for exceptional, world-class environmental research across a broad and diverse range of environmentally relevant topics. Prospective authors are encouraged to review recent issues of *ES&T* to gain an understanding of the topics that are of greatest interest to the journal’s readers, and they are expected to establish in their cover letters the relevance of their submissions to the *ES&T* community.

**Note:** Due to the volume of manuscripts we receive, *ES&T* is unable to accept pre-submission
inquiries.

**Thematic Section Headings**

Current *ES&T* topical categories for research articles are as follows:

- Anthropogenic Impacts on the Atmosphere
- Biogeochemical Cycling
- Contaminants in Aquatic and Terrestrial Environments
- Data Science
- Ecotoxicology and Public Health
- Energy and Climate
- Sustainable Systems
- Treatment and Resource Recovery

These categories are periodically reviewed and may be changed.

**Manuscript Types**

*ES&T* accepts the following manuscript types: Research Articles, Features, Viewpoints, Critical Reviews, Policy Analysis, Perspectives, Letters to the Editor, Correspondence/Rebuttals and Additions and Corrections. A full description of each manuscript type is shown below:

**Research Article** (length limit: 7,000 word-equivalents). Research articles in *ES&T* must report original research that is expected to have a definable impact on the advancement of environmental chemistry, science, technology and policy. *ES&T* welcomes rigorous scholarship on complex environmental processes and phenomena, particularly those affected by human activities. This includes chemical, biological, and physical phenomena in natural and engineered environmental systems, as well as mathematical and computational methods that are directly relevant to the understanding, protecting, restoring, and managing of the natural environment, including eliminating, minimizing, and mitigating human impacts. The journal also publishes articles that describe significant scientific advances or novel technologies for facilitating the solutions of critical environmental problems, including pollution remediation, control, prevention, and avoidance. Papers in the area of ecotoxicology and human environmental health should provide novel information on effects of chemicals or lead to new insights into the mechanisms and processes underlying effects of chemicals and other stressors. *ES&T* also encourages submission of studies that address challenges associated with the "Replacement, Reduction and Refinement" of animal studies. At submission, authors must provide a short synopsis statement (approximately 20 words), placed after the abstract, stating the environmental relevance and significance of their research work. Authors are also expected to provide an explanation in their cover letter why they believe the manuscript belongs in *ES&T* and why their research will interest our readers with an emphasis on the novelty and environmental relevance of the contribution.

*ES&T* Expectations: *ES&T* strives to publish novel research of scientific significance and high environmental importance. Insufficient novelty is common reason manuscripts are declined. Novelty is defined as new experimental data, new interpretations of existing data, or new analyses of environmental phenomena that provide important new insights into environmental processes. Significance is judged with respect to the breadth of impact of the reported findings. Manuscripts that report data of a routine nature or that address topics that are already well understood will not be considered. Whenever possible, research on new measurement technologies should include results with authentic environmental samples, and evaluations should be performed under environmentally realistic conditions. The expectations of manuscript novelty
and quality are further described in the recent *ES&T* editorials ‘Making Waves’ and ‘Evolving Today to Best Serve Tomorrow’.

### ES&T Minimum Requirements:

- All studies must clearly articulate the environmental relevance of the study to the broad *ES&T* community.
- Studies should provide novel insights into relevant environmental processes or mechanisms, i.e. studies that only describe the outcomes of standard laboratory or field tests or commercially available products are not appropriate for publication in *ES&T*.
- An assessment of uncertainty or sensitivity analysis should be included in reported data where applicable, with adequate quality assurance/quality control reported. New analytical methods should be thoroughly developed and quality ensured.
- Manuscripts should include evaluations performed under environmentally realistic conditions and concentrations. Concentrations should be reported as measured and not nominal. Ensure that key variables are measured and reported if relevant, e.g. pH
- Manuscripts on toxicity and ecotoxicity should include positive and negative controls, and consider multiple concentrations relevant to environmental exposures and/or a time-course study. Results should inform AOPs or mechanisms of action.
- The scope of the reported data in ambient monitoring studies must yield conclusions applicable to more than the particular site or time when the data were taken, i.e. findings should not be location specific representing a case study, but rather generalizable and/or transferable to other contexts.
- Studies on environmental contaminants should provide information that is clearly related to that compound’s fate, transport, transformation and/or effects in the environment.
- Manuscripts on adsorption should consider kinetics as well as isotherms. First-principle models of mass transfer are preferred over purely empirical models.
- Manuscripts that emphasize chemical engineering, new catalysts synthesis or analytical chemistry must provide a concise argument that the research represents an advance that is of primary importance to the environmental field, and include comparison to state-of-the-art approaches where appropriate.
- Manuscripts on novel materials (e.g. sorbents or catalysts) should demonstrate the materials have been tested under at least one environmental condition using relevant concentrations of target contaminant.
- Manuscripts on air quality and particulate matter should include adequate characterization of the particles relevant to the study.
- Articles describing advances in treatment technologies for remediation of contaminated environments or control of emissions should go beyond kinetics and treatability studies by exploring the mechanisms of the technology, or develop process models to describe the technique.
- If a manuscript proposes a new application, a general energy analysis or life-cycle assessment should be provided and compared against conventional methods.
- Articles that describe laboratory-scale studies should make meaningful and unbiased comparisons to existing approaches but should not make claims about the economics or relative advantages of the technology without pilot- or full-scale validation studies or properly validated models.

Manuscripts that report on initial findings of an urgent nature may be submitted to *Environmental Science & Technology Letters (ES&TL)*.
Research articles are reviewed initially by the Executive Editor team. If appropriate, manuscripts are then assigned to an associate editor for review, who may then, if appropriate, send the manuscript for full peer review by other scientists who assess the significance, originality, and validity of the work. The Editor-in-Chief, executive editors, and associate editors, listed in the ES&T masthead, make final decisions about all research material published in ES&T.

**Feature** (length limit: 5,000 word-equivalents). Feature articles are written in a magazine or journalistic style rather than as a scientific article. This article type should provide a balanced examination of significant developments and issues affecting the environmental community. The assessment of timely topics from multiple perspectives—scientific, regulatory, technical—should provide readers with an authoritative and up-to-date understanding of the subject. Features will undergo peer review, with reviewers providing comments on the factual accuracy, clarity, and significance of the contribution. Prospective authors are encouraged to review already published Feature articles in ES&T to understand style and content. At submission, authors must provide a short synopsis statement (approximately 20 words), placed after the abstract, stating the environmental relevance and significance of their research work. Corresponding authors of accepted articles will also be requested to provide a short biography (up to 200 words) and headshot for inclusion at the end of the published article.

**Viewpoint** (length limit: 1,000 words + author affiliations + 5 references + 1 single-frame figure with 50-word caption OR a 350-word table). Viewpoints are short opinion-style manuscripts, written in the style of an opinion piece in a newspaper or magazine. They provide authors with a venue to comment on an issue of pressing importance to ES&T’s readership. Viewpoint articles should express an opinion of a clear scientific nature, based on rigorous scientific research in an environmental discipline. They should not be wholly political or summary in nature. Viewpoints should not include new scientific data. Viewpoints are not peer-reviewed but are reviewed internally by at least 2 members of the ES&T Editorial team. Corresponding authors of accepted articles will also be requested to provide a short biography (up to 200 words) and headshot for inclusion at the end of the published article.

**Critical Review** (length limit: 10,000 word-equivalents). These manuscripts are thoroughly documented, forward-looking comprehensive assessments of particular areas in the environmental science and technology research domain. Critical Reviews should increase readers’ knowledge through discriminating analysis and insightful organization of the material. Critical Reviews are not intended to consist of catalogues of prior research and must go beyond synthesis to include analysis. Factors considered when evaluating Critical Reviews include the current and likely future importance of the field under review, thoroughness of the literature coverage, clarity of the presentation, and identification of future research needs.

**Please note:** Potential authors of Critical Reviews must first submit a proposal and cover letter (via the ES&T submission site in the ACS Paragon Plus Environment). The proposal, to be uploaded as a single manuscript file, should include the following details:

1. Proposed title
2. Author names and affiliations
3. Corresponding author’s email address, profile on institutional website (if available), and Google Scholar, Web of Science, or Scopus profile
4. Abstract (length limit: 500 words)
5. Topical outline (length limit: three pages), indicating the headings of sections and
subsections, a brief discussion of the proposed content of each section, and key references for each section

6. List of up to five of the authors’ papers related to the review topic
7. List of key previous reviews on the subject in the past 10 years
8. Justification for the need for another review on the topic targeting the broader readership of *ES&T*

An assigned editor will issue a decision on the proposal, and in exceptional cases may be sent for peer review. If approved, the authors will be invited to submit a full Critical Review for further consideration. If the full Critical review is favorably received by the assigned editor, the manuscript will then undergo peer review.

**Perspective** (length limit: 4,000 word-equivalents). These contributions are personal reviews of a field or area, and they are focused, rather than comprehensive. Perspective authors are asked to assess the current status of a chosen field with an emphasis toward identifying key progress being made and research that is needed to advance a sub-discipline, theory, or technology. Perspectives should be based on scientifically sound statements with sufficient references and scientific underpinning to substantiate the views expressed. At submission, authors must provide a short synopsis statement (approximately 20 words), placed after the abstract, stating the environmental relevance and significance of their research work. Perspectives will undergo peer review. Perspective articles can be submitted directly through the *ES&T* submission site without prior approval. Corresponding authors of accepted articles will also be requested to provide a short biography (up to 200 words) and headshot for inclusion at the end of the published article.

**Policy Analysis** (length limit: 7,000 word-equivalents). These manuscripts typically focus on the interface of science and engineering with public policy and provide new insight for understanding and managing human–environmental systems. Topics of particular interest include risk assessment, critical evaluations of environmental regulations, and environmental cost-benefit analyses. At submission, authors must provide a short synopsis statement (approximately 20 words), placed after the abstract, stating the environmental relevance and significance of their research work. Policy analysis articles will undergo peer review.

**Letter to the Editor** (length limit: 500 words + author affiliations + 250 words of references). Letter to the Editor contributions provide comments on the following already-published journalistic article types only: Features, Viewpoints, and Editorials (Comments). Letters to the Editor should be submitted within two months of the publication date of the original material. The author(s) of the original material will be given an opportunity to reply. If appropriate, both articles will be published in the same issue. These articles are not peer reviewed.

**Please note:** Contributors wishing to comment on research content (this includes Research Articles, Policy Analysis, Critical Reviews, Perspectives, Correspondence/Rebuttals, and Additions and Corrections), please submit a Correspondence/Rebuttal.

**Correspondence/Rebuttal** (length limit: 1,000 word-equivalents each including citations). These manuscripts provide scholarly comment on papers appearing in the research section (Research Articles, Policy Analyses, Critical Reviews, Perspectives, Correspondence/Rebuttals, and Additions and Corrections). Correspondence should be submitted within twelve months of the publication date of the original paper and must raise substantive scientific or technical questions. Well-justified exceptions to this timeframe will also be considered. Correspondence that consists mainly of opinion will not be considered. The author(s) of the original paper will be given an
opportunity to prepare a response within one month of receiving the Correspondence. Correspondence on previously published Correspondence will not be considered, and personal invective will not be tolerated. Correspondence/Rebuttal may undergo peer review at the determination of the assigned editor. The correspondence and the rebuttal will be published consecutively in the same issue.

Additions and Corrections (Errata). These contributions may be used by the authors of a paper to correct errors and omissions of consequence that are identified after publication. Readers who also detect errors of consequence in the work of others should contact the corresponding author of the paper in question. Additions and Corrections must be approved by all coauthors before submission. All Additions and Corrections are subject to editorial approval, and corrections of minor errors or omissions will not be published.

Special Issues. ES&T has a required template that must be completed for all proposals for special issues. If you would like to propose a special issue, please contact the managing editor via email: managing.editor@est.acs.org.

ACS Publishing Center

While this document will provide basic information on how to prepare and submit the manuscript as well as other critical information about publishing, we also encourage authors to visit the ACS Publishing Center for additional information on everything that is needed to prepare (and review) manuscripts for ACS journals and partner journals, such as

- Mastering the Art of Scientific Publication, which shares editor tips about a variety of topics including making your paper scientifically effective, preparing excellent graphics, and writing cover letters.
- Resources on how to prepare and submit a manuscript to ACS Paragon Plus, ACS Publications’ manuscript submission and peer review environment, including details on selecting the applicable Journal Publishing Agreement.
- Sharing your research with the public through the ACS Publications open access program.
- ACS Reviewer Lab, a free online course covering best practices for peer review and related ethical considerations.

Manuscript Preparation

Quality Expectations

Clearly articulating the importance of your research and the quality of presentation of your manuscript will have an important impact on the ease with which it can undergo peer review and the impression it gives to reviewers of its overall quality. If your writing is rambling, fails to establish the purpose of the research, provides an incoherent discussion, puzzling figures, or inappropriate scales on graph axes, the technical merits of your research will be less easy to recognize. Please articulate clearly the purpose of your work, write concisely and with clarity, and provide well thought-out and clearly presented figures and tables with appropriate considerations of the magnitude of error. This will significantly increase the likelihood that we will publish your research.

Submit with Fast Format
All ACS journals and partner journals have simplified their formatting requirements in favor of a streamlined and standardized review-ready format for an initial manuscript submission. This change allows authors to focus on the scientific content needed for efficient review rather than on formatting concerns. It will also help ensure that reviewers are able to focus on the scientific merit of a submission during the peer review process and speed the transfer process to a different ACS journal if applicable. Read more about the requirements and the benefits these serve authors and reviewers [here](#). Manuscripts submitted to *ES&T* for initial consideration must adhere to these standards:

- The preferred format for *ES&T* manuscript files is a Microsoft Word document with the text and all graphics, including Table of Content art (TOC art), embedded within that single Word file.
- The text of all article types should be double-spaced in a single column with the lines numbered consecutively in a separate column at the margin.
- Submissions must be complete with clearly identified standard sections used to report original research, free of annotations or highlights, and include all numbered and labeled components.
- Figures, charts, tables, schemes, and equations should be embedded in the text at the point of relevance. Separate graphics can be supplied later at revision, if necessary.
- References can be provided in any style, but they must be complete, including titles. For information about the required components of different reference types, please refer to the [ACS Style Quick Guide](#).
- Supporting Information should be submitted as a separate file(s).

**Document Templates and Format**

The use of manuscript templates is not required for *ES&T*, but may be useful to consult to approximate how an article will compose. Learn more about document templates:

- [Microsoft Word 2011 Template](#) for Macintosh
- [Microsoft Word 2010 Template](#) for Windows | [README file](#) [PDF]

Additional generic instructions for submission of manuscripts and Supporting Information are available at the [ACS Publishing Center](#). General information on the preparation of manuscripts can also be found in the [The ACS Style Guide](#).

**Length limits.** The length limits for each article type are listed in the Article Types section. With the exception of Viewpoints and Letters to the Editor, article length can be determined by counting all text, excluding title page, references, and figure/table captions. Next, add 300 words for each small figure, scheme, or table that takes up part of a page. Large multipart figures, extensive tables, detailed maps or chemical pathways taking up a page or more should be counted as 600 words. At the discretion of the assigned editor, some figures or tables may be counted as more than 600 words.

Manuscripts that exceed the length limit will be un-submitted (returned to the Draft section in Paragon Plus) with a request to shorten, or they may be immediately rejected. To reduce length, make the Introduction and Discussion sections more concise. In addition make appropriate use of Supporting Information (SI; see below), which is also readily available to readers of the manuscripts on the *ES&T* website.

Authors who believe that exceeding the length limit is essential must include a compelling
argument in their cover letters. Ultimately, however, the decision about whether a manuscript that exceeds the recommended length is appropriate for review is made by the assigned editor.

**Acceptable Software, File Designations, and TeX/LaTeX**

See the list of [Acceptable Software](#) and appropriate [File Designations](#) to be sure your file types are compatible with ACS Paragon Plus. Information for manuscripts generated from TeX/LaTeX is also available.

**Cover Letter**

A cover letter must accompany every manuscript submission. In your cover letter, please provide a rationale for publication in *ES&T*, making the environmental relevance clear. A substantial fraction of submissions to *ES&T* are not sent out for review because an editor concludes that the manuscript does not meet the journal’s standards for novelty, scientific merit, or environmental importance. The cover letter is your opportunity to convince the editor that this is not the case. Citations of previous related work published within *ES&T* also can be useful to the reviewing editor.

During the submission process, you may type it or paste it into the submission system, or you may attach it as a file. The cover letter should list the authors and their affiliations, give the manuscript title, and provide complete contact information for all authors. If you have a non-preferred editor, you may explain your reason for making the request in your cover letter.

**Manuscript Text Components**

Assume *ES&T* readers are professionals who are not necessarily experts in your particular field. Spell out all acronyms on first use in the abstract and in the body of the article. *ES&T* does not allow footnotes, with the exception of an author information footnote on the title page and table detail/definition footnotes.

**Elements of a Manuscript**

The various sections of the manuscript are described in detail below:

- Title and Authorship
- Abstract, Keywords and Synopsis
- Graphic for Table of Contents (TOC)/Abstract Art
- Introduction
- Materials and Methods
- Results and Discussion
- Abbreviations
- Acknowledgment
- Funding Sources
- References
- Tables and Figures
- Formulae and Equations
- Chemical Structures
- Web Enhanced Objects (WEO)
- Supporting Information
Title. Use a brief, specific, and informative title. Keywords in titles assist in effective literature retrieval. If trade names are used, give generic names in parentheses.

Authorship. List the full first name, middle initial(s), and last name of each author. Omit professional and official titles. An author’s affiliation should be based on where they were when the work was performed. When the present address of an author is different, include the new information in a footnote. In a paper with more than one author, the name of the corresponding author, to whom post-publication inquiries should be addressed, carries an asterisk (*). Provide an email address for the corresponding author.

Many funders and institutions require that institutional affiliations are identified for all authors listed in the work being submitted. ACS facilitates this requirement by collecting institution information during the manuscript submission process in ACS Paragon Plus (Step 2 in Paragon Plus: Authors and Affiliations).

Include as co-authors all those who have made a substantial contribution to the work. Addition or deletion of an author(s) after submission of the manuscript requires justification from the corresponding author and is subject to editorial approval. Deceased persons who meet the criteria for inclusion as coauthors should be included, with an 'Author Information' note, indicating the date of death.

Abstract, Keywords and Synopsis.
Abstract. A 150–200-word clear and concise abstract must accompany Research Articles, Critical Review, Policy Analysis and Perspective manuscripts. As a one-paragraph summary, describe the purpose, methods or procedures, significant new results, and implications. Define any abbreviations or acronyms used in the abstract. Include major quantitative data if they can be stated briefly, but do not include background material. Do not include reference numbers in the abstract.

For Features, include a shorter 3–5 sentence Abstract, written at a level comprehensible to the scientifically literate general public. An abstract is not required for Viewpoint manuscripts.

Keywords. Research Articles, Policy Analysis, Reviews, Perspectives, Features and Viewpoints must be accompanied by 5–8 keywords. Authors are encouraged to include significant keywords that do not appear in the title to expand discoverability and aid the reader in literature retrieval. The keywords are published immediately before the text, following the abstract.

Synopsis. A synopsis is a succinct, simple, non-technical statement (~30 words) articulating the environmental context and environmental impact of your research or policy. The synopsis is mandatory for Research Articles, Policy Analysis, Perspectives and Features and must be present at submission. The synopsis should use complete sentences. The synopsis is NOT a repeat of the abstract or a description of the TOC/Abstract graphic.

Example of an ES&T synopsis: ‘Minimal research exists on microplastics exposure from indoor air. This study reports microplastics at higher concentrations in indoor air and dust compared to outdoors with implications for human health.’

Graphic for Table of Contents (TOC)/Abstract Art. This graphic, required for Research Articles,
Reviews, Perspectives, and Features, appears next to the abstract online and in all versions of the article. It is also used in other situations in which a representative graphic is needed (e.g. social media). The selected image should give readers a quick visual representation of the essence of the paper. It should be simple and relatively free of text and technical characters, and make use of color for visual impact. Abstract art may include a photograph of a field site or a schematic portraying the central findings of the paper. Please consult a recent issue of the journal for examples. Guidelines for TOC/Abstract Art specifications are also available. Please also see Appendix 3 for a list of approved graphics programs that have acceptable copyright agreements in place for the commercial use of graphics drawn by the author.

All portions of the TOC graphic must have been created by the authors of the paper. Material not actually created by the authors cannot appear in TOC graphics even if the copyright owner of the material does not want credit.

Size requirement = 240-point width by 135-point height (3.25” x 1.75”; approx. 8.25 cm by 4.45 cm)

Additional specifications:
- Images must be original (not previously published) and created by one of the authors of the paper.
- No copyright, credit, permission, or attribution statements are allowed.
- No captions or legends are permitted.
- Photographs may not show any identifiable individuals unless a model release is provided for ALL identifiable individuals. Any photographs must have been taken by an author of the paper.
- No copyrighted, public domain, Creative Commons license, ClipArt, or stock photo material may be used.
- No postage stamps, currency, or trademarked items (company or institutional logos, images, and products) may appear in the graphic.
- No maps may be used.
- TOC art is subject to final approval by the assigned editor
- Authors must certify in their cover letters that they have complied with this TOC art policy and confirm that the submitted image was created by an author and has never been published.

**Introduction.** The introduction should clearly and concisely explain the motivation for the work, its importance and originality, where it fits in the development of the field and why it should be of interest to *ES&T* readers. Discuss relationships of the study to previously published work, but do not reiterate or provide a complete literature survey. Current findings should not be included or summarized in this section. Introduction sections are typically around 500 words in length.

**Materials and Methods.** Describe pertinent and critical factors involved in the experimental work but avoid excessive description. Details not essential for understanding the paper can be placed in Supporting Information (SI). Specific experimental methods should be sufficiently detailed for others to repeat the experiments unequivocally. List devices of a specialized nature or instruments that may vary in performance or affect the quality of the data obtained (e.g. spectroscopic resolution), including the vendor. If the procedures are already published, provide citations to previous publications and expand only on differences in the current work. Authors must emphasize any unexpected, new, and/or significant hazards or risks associated with the reported work and this safety information must be included in the Materials and Methods section.
Results and Discussion. Be complete but concise. Discuss your findings, postulate explanations for the data, elucidate models and compare your results with those of others. Avoid irrelevant comparisons or contrasts, any speculation unsupported by the data presented and verbose discussion. A separate conclusion is not to be used; any concluding statements are to be incorporated under Results and Discussion.

Abbreviations. Specialized abbreviations may be used provided they are placed in parentheses after the word(s) at first point of use. Do not include a separate Abbreviations list. Use SI units, and consult the The ACS Style Guide for lists of SI units and preferred forms of commonly used abbreviations.

Acknowledgment. Include only essential credits to acknowledge financial or professional assistance to the conduct of research. Sources of financial support must be acknowledged. Omit academic and social titles.

Author Information. A section may be included, as needed, entitled “Author Information” to provide pertinent information on the authors, such as the names of authors who contributed equally to the article, or details of the date of death of a deceased author.

Funding Sources. Authors are required to report ALL funding sources and grant/award numbers relevant to their manuscript. To meet this requirement, the submitting author must enter all sources of funding for ALL authors relevant to the submission in BOTH the Open Funder Registry tool in ACS Paragon Plus submission site, and in the manuscript. See this page for complete instructions. In the manuscript, funding should be acknowledged in the acknowledgment section.

References. Literature references in ES&T must be numbered in order of appearance, and the corresponding numbers placed at the appropriate locations in the text as superscripted numerals. The accuracy of the References is the responsibility of the authors, who are encouraged to avoid references to works that have not been peer reviewed. DOI numbers are helpful but not mandatory unless they are the only identifying information available (e.g. for recently published articles). Excessive self-citation is not permitted. Any references in publications that would be difficult for most reviewers to obtain or are unpublished should be uploaded into the ES&T Paragon Plus submission site as Information for ‘Review Only’.

Examples of reference formats are available here. Authors can also consult The ACS Style Guide for additional information on reference style and format.

Tables and Figures
Tables and figures should be carefully designed to maximize presentation and comprehension of the experimental data with superfluous information excluded. Please see Appendix 3 for a list of approved graphics programs and websites that have acceptable copyright agreements in place for commercial use of graphics and images.

Tables. Tables should be simple, concise, and supplement, not duplicate, information presented in the text and figures. Tables should be embedded in the text at the point of relevance, and be furnished with appropriate titles of one phrase or sentence. The title should be understandable without reference to the text. Details or definitions should be placed at the bottom as footnotes. Tables should be numbered consecutively with Arabic numbers (i.e., 1, 2, ...). Double-space them with wide margins, ensure that each data entry is placed in its own cell, and prepare tables in a
consistent format, preferably using a word processor’s table format feature.

**Figures.** Please see Appendix 2 for further details on how to prepare your figure graphics, and Appendix 3 for a list of approved graphics programs and websites that have acceptable copyright agreements in place for the commercial use of drawn graphics and copied images. All figure graphics must be prepared and submitted in digital format and preferably embedded in the text at the point of relevance. Graphics should be numbered consecutively with Arabic numbers (i.e., 1, 2, ) and accompanied by a caption. It is also acceptable to submit separate TIFF, PDF, EPS (vector artwork), or CDX (ChemDraw file) files. If separate graphic files are submitted, they should be named in a manner clearly identifying their function (e.g., Scheme 1, Figure 1). Each separate graphic file must also include the caption for the respective graphic in the manuscript itself.

Each figure graphic should have good resolution, be clear, concise, and complete and use legible font. Colors may be used to enhance graphics. Graphics must meet the journal’s minimum quality standards or will be returned to authors for improvement. Any graphic (figure, chart, scheme or equation) that has appeared in an earlier publication should include a Credit Line citing the original source. Authors are responsible for obtaining written permission to re-use this material.

Special requirements for EPS and TIFF files graphics (both when embedded in a Word file and when submitted separately):
- EPS files: All fonts must be converted to outlines or embedded in the graphic file. The document settings should be in RGB mode.
- TIFF files: Black & white line art must have a resolution of 1200 dpi; grayscale art (a monochromatic image containing shades of gray) must have a resolution of 600 dpi; and color art (RGB color mode) must have a resolution of 300 dpi.

In addition, ACS Authoring Services can prepare your figures, tables and illustrations to the exact specifications of the journal on your behalf. This includes changes to file type, resolution, color, space, font, scale, line weights and layout (to improve readability and professional appearance).

**Formulae and Equations.** Chemical formulas should be embedded in the text at the point of relevance and should correspond to The ACS Style Guide. Chemical equations should be balanced and numbered consecutively along with mathematical equations. Mathematical arguments should be as brief as possible.

**Chemical Structures.** Chemical structures should be produced with the use of a drawing program such as ChemDraw.

**Web Enhanced Objects (WEO).** The web editions of ACS journals allow readers to review multimedia attachments such as animations and movies that complement understanding of the research being reported. WEOs should be uploaded in ACS Paragon Plus with ‘Web Enhanced Object’ selected as the file designation. Consult the list of compatible WEO formats.

**Supporting Information.** Ancillary data and material of interest mainly to specialists is placed in Supporting Information to shorten the length of text in research manuscripts. Please see the section on Supporting Information (SI) (Optional) for further details below.

**Front Cover Artwork.** ES&T features a different image on the front cover of each issue. The cover art image is usually related to work that is published in that particular issue of the
Authors are encouraged to submit images to be considered for use on future front covers at the time of their initial submissions.

Images to be considered for the cover should be eye-catching, imaginative and original. Unpublished images are encouraged. Covers should be submitted as an electronic file in eps, tif, jpg, or png format (not pdf or ppt), and be approximately 8 inches wide and 11 inches high, with a minimum resolution of 300 dpi (color) (2400 x 3300 pixels). The file should be sent as a layered file to enable art enhancement of individual elements. The top 3 inches of the cover image will be obscured by the journal logo, and the bottom 1 inch will be obscured by the ACS Publications bar. Authors should also include a 5-10 word caption that will appear on the front cover, and a short (less than 50 words) description of the cover that will be published alongside the image. Examples of previous ES&T covers can be seen at https://pubs.acs.org/loi/esthag.

If the image has been previously published, authors should include a signed permission form from the publisher to reprint the image in all media formats (print and electronic). See Copyright and Permissions on the ACS Paragon Plus website for more information. If your art is selected for front cover, it will be published at no cost to the authors. ACS will also send you information about how to request one complimentary 18” by 24” printed poster featuring your work.

ES&T also offers authors a great way to promote their work through Supplementary Covers. Submit your cover idea, artwork, and caption when submitting your manuscript revision in ACS Paragon Plus. If your article is accepted for publication, your suggestion may be selected for use on one of the journal’s supplementary covers.

Disclosures

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4. MIQE guidelines for ddPCR and QPCR by Bustin et al. 2009 and Hugget et al. 2020
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Appendix 2: Preparing Graphics

Resolution

Digital graphics pasted into manuscripts should have the following minimum resolutions:

- Black and white line art, 1200 dpi
- Grayscale art, 600 dpi
- Color art, 300 dpi

Size

Graphics must fit a one- or two-column format. Single-column graphics can be sized up to 240 points wide (3.33 in.) and double-column graphics must be sized between 300 and 504 points (4.167 in. and 7 in.). The maximum depth for all graphics is 660 points (9.167 in.) including the caption (allow 12 pts. For each line of caption text). Lettering should be no smaller than 4.5 points in the final published format. The text should be legible when the graphic is viewed full-size. Helvetica or Arial fonts work well for lettering. Lines should be no thinner than 0.5 point.

Color

Color may be used to enhance the clarity of complex structures, figures, spectra, and schemes, etc., and color reproduction of graphics is provided at no additional cost to the author. Graphics intended to appear in black and white or grayscale should not be submitted in color.

Type of Graphics

Table of Contents (TOC)/Abstract Graphic

Consult the Guidelines for Table of Contents/Abstract Graphics for specifications.

Figures

A caption giving the figure number and a brief description must be included below each figure. The caption should be understandable without reference to the text. It is preferable to place any key to symbols used in the artwork itself, not in the caption. Ensure that any symbols and abbreviations used in the text agree with those in the artwork.
Charts (groups of structures that do not show reactions) may have a brief caption describing their contents.

Tables

Each table must have a brief (one phrase or sentence) title that describes the contents. The title should be understandable without reference to the text. Details should be put in footnotes, not in the title. Tables should be used when the data cannot be presented clearly in the narrative, when many numbers must be presented, or when more meaningful inter-relationships can be conveyed by the tabular format. Tables should supplement, not duplicate, information presented in the text and figures. Tables should be simple and concise.

Schemes

Each scheme (sequences of reactions) may have a brief caption describing its contents.

Chemical Structures

Chemical structures should be produced with the use of a drawing program such as ChemDraw.

Cover Art

ES&T authors are encouraged to submit images to be considered for use on the journal’s front cover or Supplementary Covers at the time of the submission of their revised manuscript. If your article is accepted for publication, your artwork suggestion may also be selected for use on one of the journal’s covers. If your art is selected for front cover, ACS will send you information about how to request one complimentary 18” by 24” printed poster featuring your work.

Cover image submissions should be eye-catching, imaginative and original. Unpublished images are encouraged. The cover image should not resemble a graphical abstract or data figure, but rather should be an artistic and scientifically accurate representation of the manuscript.

Image files should be submitted as TIF, JPG, PNG or EPS files with a resolution of at least 300 dpi for pixel-based images. Images should be 8.19 in × 10.00 in. (or 20.80 cm × 25.40 cm). Please note that the journal title will cover the top 3 in. (7.62 cm) of the image. Authors should submit the cover image along with a 5-10 word caption explaining the artwork, and a short, clear legend (less than 50 words) that will appear alongside the front cover explaining the image, as supplementary files to ACS Paragon Plus with their revised manuscript.

If you wish to be considered only for the front cover which is published at no cost to the authors, and not a paid supplementary cover, please respond NO accordingly to the Supplementary Cover Art question in ACS Paragon Plus. For more information on the Supplementary Covers program, please see this webpage. All art submitted for consideration for a supplementary cover will also be considered for a front cover.

Appendix 3: Approved Graphics Programs

Web Enhanced Objects (WEO)
The Web editions of ACS journals allow readers to view multimedia attachments such as animations and movies that complement understanding of the research being reported.

WEOs should be uploaded in ACS Paragon Plus with ‘Web Enhanced Object' selected as the file designation. Consult the list of compatible WEO formats.

**Approved Graphics Programs and Websites with Compliant Copyright Licenses for Commercial Use**

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- Frontier Media (authors own copyright and allow CC-BY license)
- Adobe (standard license)
- TurboSquid (royalty free license)
- Cinema4D (www.maxon.net)
- Pexels
- Pickit
- Freeimages.com
- Autodesk 3DS Max 2015 software
- Photoshop
- Inkscape
- Dreamstime.com
- ChemDraw
- PyMOL
- Microsoft ClipArt
- Wordclouds.com
- Piktochart
- 123RF.com
- Blender
- Mapchart
- Brusheezy
- openclipart.org (CC-BY - allows commercial use)
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- eLife Science (creative commons license)
- Megapixel (royalty free license)
- Protein Database
- Visual Molecular Dynamics (VMD)
- gettyimages.com
- Protter
- Shade 3D
- 3D Max
- QGIS software (uses GNU General Public licenses)
- "R" software (uses GNU General Public license)
- SVG Map v 1.5
- GIMP
• Avogadro Software
• 3D Sketchup Software
• Solidworks
• ArcGIS
• Affinity Designer (v 1.7, Serif Europe Ltd.)
• dreamgenerator.com
• XCrySDen
• National Gallery of Art/NGA Images. With the launch of NGA Images, the National Gallery of Art in Washington, DC implements an open access policy for digital images of works of art that the Gallery believes to be in the public domain. Images of these works are now available free of charge for any use, commercial or non-commercial. Users do not need to contact the Gallery for authorization to use these images as long as credit is given to the National Gallery of Art, Washington, DC. The images are available for download at the NGA Images website (images.nga.gov).