DESCRIPTION

Environmental Research publishes original reports describing studies of the adverse effects of environmental agents on humans and animals. The principal aim of the journal is to assess the impact of chemicals and microbiological pollutants on human health. Both in vivo and in vitro studies, focused on defining the etiology of environmentally induced illness and to increase understanding of the mechanisms by which environmental agents cause disease, are especially welcome. Investigations on the effects of global warming/climate change on the environment and public health, as well as those focused on the effects of anthropogenic activities on climate change are also of particular interest.

Although Environmental Research is opened to all subjects directly related with this field, areas of special interest include:

- Air, soil, and water pollutants and health
- Biomonitoring and adverse human health effects
- Environmental and occupational medicine
- Environmental epidemiology
- Environmental microbiology
- Environmental toxicology
- Environmental transport and fate of pollutants
- Global warming/climate change
- Nanomaterials in the environment and nanotoxicology
- Risk analysis, risk assessment and risk management, and public health
- Waste treatment and disposal
- Water and wastewater management, and sewage

IMPACT FACTOR

2016: 3.835 © Clarivate Analytics Journal Citation Reports 2017

ABSTRACTING AND INDEXING

MEDLINE®
EDITORIAL BOARD

Editor-in-Chief:
José L. Domingo, Universitat Rovira i Virgili, Reus, Catalonia, Spain

Associate Editors:
José Dórea, University of Brasilia, Brasilia, DF, Brazil
Nancy Bixian Mai, Chinese Academy of Sciences (CAS), Guangzhou, China
Ana Navas-Acien, Columbia University, New York, New York, USA

Editorial Board Members:
Michael Bloom, University at Albany, SUNY, Rensselaer, New York, USA
Environmental and reproductive epidemiology, endocrine disruptors.
Joanna Burger, Rutgers University, Piscataway, New Jersey, USA
Eco-toxicology, behaviour, monitoring and assessment, birds and reptiles
Paco Bustamante, Université de La Rochelle, La Rochelle, France
Mariano E. Cebrián, Cinvestav, Mexico D.F., Mexico
Arsenic metabolism Effects of metals and pesticides on the heme synthesis pathway Effects of metals and pesticides on male reproductive health (hormones and semen quality)
Kristie Ebi, ClimAdapt, Seattle, Washington, USA
"health risks of climate change, including from extreme events, thermal stress, foodborne and waterborne safety and security, vector borne diseases, undernutrition, and migration adaptation to the risks of climate change, particularly the health risks. health co-benefits. impacts of extreme weather and climate events. resilience, vulnerability, scenarios, international assessments"
Stephanie Engel, University of North Carolina, Chapel Hill, North Carolina, USA
Swaran Jeet Singh Flora, National Institute of Pharmaceutical Education and Research, Raebareli, India
Heavy Metals Toxicity and Chelation Therapy
Francesco Forastiere, Lazio Regional Health Service, Rome, Italy
Marianne Hatzopoulou, University of Toronto, Toronto, Ontario, Canada
Gerard Hoek, Utrecht University, Utrecht, Netherlands
exposure assessment, air pollution modeling, environmental epidemiology
Milena Horvat, Jožef Stefan Institute, Ljubljana, Slovenia
Michael Jerrett, University of California at Berkeley, Berkeley, California, USA
Kurunthachalam Kannan, University at Albany, SUNY, Albany, New York, USA
Human exposure assessment and biomonitoring
Ki-Hyun Kim, Hanyang University, Seoul, The Republic of Korea
VOC; Odor; Air quality; MOF; Sensing; Removal; Synthesis
Demetrios Kouretas, University of Thessaly, Larissa, Greece
Molecular mechanisms of antioxidant activity of antioxidants, oxidative stress and exercise, markers of redox status in human, biofunctional food development
Duk-Hee Lee, Kyungpook National University, Daegu, The Republic of Korea
Epidemiology, Cohort study, Case-control study, Persistent Organic Pollutants, Organochlorine pesticides, Polychlorinated biphenyls, Endocrine disrupting chemicals, Chemical mixtures, Methodological issues in human studies, Obesity, Diabetes, Cardiovascular diseases, Cancer, Dementia
Lena Ma, University of Florida, Gainesville, Florida, USA
Soil pollutants and health, environmental transport and fate of pollutants, risk assessment and public health, waste treatment and disposal
Jacek Namieśnik, Technical University of Gdańsk, Gdańsk, Poland
environmental analytics and monitoring, food analysis, QA/QC systems, green analytical chemistry, envirometrics
Xavier Querol, Consejo Superior de Investigaciones Científicas (CSIC), Barcelona, Spain
Environmental geochemistry; Air quality; Atmospheric aerosols; Tropospheric ozone; Black carbon; Ultrafine particles; Metals; Organic pollutants; Inorganic gaseous pollutants, NO2, NO, NOx, SO2, SO3, CO, NH3; Source apportionment; Urban and regional pollution; Atmosphere and climate change; Air quality policy; Mobile, industrial, domestic and agricultural emissions of air pollutants; Leaching of industrial wastes; Impact of mining on environment; Recycling of industrial wastes; Coal use related pollution
Mineshi Sakamoto, National Institute for Minamata Disease, Kumamoto, Japan
Christian Sonne, Aarhus University, Roskilde, Denmark
Biological effects, environmental chemicals, infectious diseases, climate change, veterinary science, wildlife medicine, predatory mammals, raptorial birds, sea birds, fish, internal organs, reproductive organs, histopathology, morphology, skeletal system, bone density, immune system, endocrinology, PBPK modelling, blood biochemistry, implantation of PTT satellite transmitters, immobilization.
Jordi Sunyer, CREAL, Barcelona, Spain
Leisa-Maree Toms, Queensland University of Technology, Kelvin Grove, Queensland, Australia
Shilu Tong, Queensland University of Technology, Kelvin Grove, Queensland, Australia
Environmental epidemiology, climate change, planetary health, sustainable development, quantitative risk assessment, spatiotemporal modelling
Paul Villeneuve, Carleton University, Ottawa, Ontario, Canada
Mary Wolff, Mount Sinai School of Medicine, New York, New York, USA
GUIDE FOR AUTHORS

Your Paper Your Way
We now differentiate between the requirements for new and revised submissions. You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.

To find out more, please visit the Preparation section below.

INTRODUCTION
A Multidisciplinary Journal of Environmental Sciences, Ecology, and Public Health

Environmental Research: A Multidisciplinary Journal of Environmental Sciences, Ecology, and Public Health publishes original reports describing studies of the toxic effects of environmental agents and conditions in humans and animals, including both experimental subjects and ecosystems. The principal aims of the journal are to increase understanding of the etiology of preventable disease and environmental impairments, and to increase understanding of the mechanisms by which environmental agents cause disease and ecological effects. Human impact on the biosphere is considerable and, thus, an additional aim of the journal is to explore the means by which the adverse effects of anthropocentric activities can be minimized through new initiatives or changes in policy, at the local, regional, national, and international scales.

The study of environmental health is inherently multidisciplinary and international. Therefore, the journal welcomes relevant articles in epidemiology, risk analysis and policy, environmental medicine, exposure assessment, geosciences and environmental chemistry, and wildlife biology and ecotoxicology, and ecology. Reports that bridge one or more of these disciplines are particularly encouraged, as are studies employing biological markers of exposure and/or effect.

The focus of the journal generally excludes papers that report results of toxicology studies or industrial exposures, unless these papers have clear relevance to environmental topics. The journal does not generally consider reports of a specific site or source (such as an assessment of releases or environmental contamination) unless these reports present novel or generalizable information. However, short papers can be submitted to the Journal as a "Case Report" (see below). Papers reporting on studies of human subjects must provide written assurance that the research was reviewed and approved by an appropriate institutional review board (or ethics committee) for the protection of human subjects. Environmental Research, in common with international practice in science, requires that all authors must, in denoting measures, utilize the metric system and SI derived units (e.g., degrees Centigrade rather than Fahrenheit; Click here.

Reports from the Field
The Journal welcomes short articles on topics of interest to environmental researchers and practitioners. Appropriate "Reports from the Field" include articles on environmental conditions, new methods for detection or analysis, updates, and case reports of human or ecosystem exposures and effects. Articles from around the world are particularly encouraged.

"Reports from the Field" should not exceed 2000 words and need not be divided into sections, although subheadings may help the reader and are encouraged. Authors must provide a short abstract (less than 75 words) and no more than two figures or illustrations, no more than 2 tables, and no more than 15 references. These papers will be peer-reviewed.

Contact Details for Submission
Authors should submit their article via EES, at https://ees.elsevier.com/ER. You will be guided stepwise through the creation and uploading of the various files. Use the following guidelines to prepare your article. For any further information please visit our Support Center.

Submission checklist
You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:
One author has been designated as the corresponding author with contact details:
- E-mail address
- Full postal address

All necessary files have been uploaded:

**Manuscript:**
- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided
- Indicate clearly if color should be used for any figures in print

**Graphical Abstracts / Highlights files** (where applicable)

**Supplemental files** (where applicable)

Further considerations
- Manuscript has been 'spell checked' and 'grammar checked'
- All references mentioned in the Reference List are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources (including the Internet)
- A competing interests statement is provided, even if the authors have no competing interests to declare
- Journal policies detailed in this guide have been reviewed
- Referee suggestions and contact details provided, based on journal requirements

For further information, visit our Support Center.

**BEFORE YOU BEGIN**

**Article Content**
We are expecting articles of the highest scientific quality. Editorials on what the Journal is expecting in manuscripts are described in: "On multiple comparisons and on the design and interpretation of epidemiological studies of many associations" Click here. Authors are also referred to the STROBE Statement Click here.

**Ethics in publishing**
Please see our information pages on Ethics in publishing and Ethical guidelines for journal publication.

**Policy and ethics**
You are requested to provide information on funding sources supporting the work described in the manuscript. For all papers dealing with research or studies on human subjects or experimental animals, evidence must be provided of review and approval by an appropriately constituted committee for human subjects or animal research.

The work described in your article must have been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans http://www.wma.net/e/policy/b3.htm; EC Directive 86/609/EEC for animal experiments http://europa.eu.int/scadplus/leg/en/s23000.htm; Uniform Requirements for manuscripts submitted to Biomedical journals http://www.nejm.org/general/text/requirements/1.htm. This must be stated at an appropriate point in the article.

**If this information is not provided upon submission, the paper will be returned without review.**

**Declaration of interest**
All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double-blind) or the manuscript file (if single-blind). If there are no interests to declare then please state this: 'declarations of interest: none'. This summary statement will be ultimately published if the article is accepted. 2. Detailed
disclosures as part of a separate Declaration of Interest form, which forms part of the journal’s official records. It is important for potential interests to be declared in both places and that the information matches. More information.

**Submission declaration and verification**
Submission of an article implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see 'Multiple, redundant or concurrent publication' section of our ethics policy for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service Crossref Similarity Check.

**Suggestion for Reviewers**
Authors must suggest a minimum of 5 names of potential reviewers who should have no conflict of interests with their work or that of their co-authors, including not working at their institution. For each suggested reviewer, authors must include: Full name and title, professional affiliation, and professional email address (avoiding yahoo, hotmail, gmail, etc. addresses). Please make sure that the email addresses you provide us with are valid and up-to-date. Give also at least one reason why the author is recommending her/his name as possible reviewer.

Please note that the journal may not use your suggestions. However, your help is appreciated and may speed up the selection of appropriate reviewers.

**Changes to authorship**
Authors are expected to consider carefully the list and order of authors before submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only before the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the corresponding author: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

**Article transfer service**
This journal is part of our Article Transfer Service. This means that if the Editor feels your article is more suitable in one of our other participating journals, then you may be asked to consider transferring the article to one of those. If you agree, your article will be transferred automatically on your behalf with no need to reformat. Please note that your article will be reviewed again by the new journal. More information.

**Copyright**
Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see more information on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for use by authors in these cases.

For open access articles: Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' (more information). Permitted third party reuse of open access articles is determined by the author's choice of user license.
Author rights
As an author you (or your employer or institution) have certain rights to reuse your work. More information.

Elsevier supports responsible sharing
Find out how you can share your research published in Elsevier journals.

Role of the funding source
You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

Funding body agreements and policies
Elsevier has established a number of agreements with funding bodies which allow authors to comply with their funder's open access policies. Some funding bodies will reimburse the author for the Open Access Publication Fee. Details of existing agreements are available online.

Open access
This journal offers authors a choice in publishing their research:

Subscription
- Articles are made available to subscribers as well as developing countries and patient groups through our universal access programs.
- No open access publication fee payable by authors.

Open access
- Articles are freely available to both subscribers and the wider public with permitted reuse.
- An open access publication fee is payable by authors or on their behalf, e.g. by their research funder or institution.

Regardless of how you choose to publish your article, the journal will apply the same peer review criteria and acceptance standards.

For open access articles, permitted third party (re)use is defined by the following Creative Commons user licenses:

Creative Commons Attribution (CC BY)
Lets others distribute and copy the article, create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), include in a collective work (such as an anthology), text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)
For non-commercial purposes, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

The open access publication fee for this journal is USD 3400, excluding taxes. Learn more about Elsevier's pricing policy: https://www.elsevier.com/openaccesspricing.

Green open access
Authors can share their research in a variety of different ways and Elsevier has a number of green open access options available. We recommend authors see our green open access page for further information. Authors can also self-archive their manuscripts immediately and enable public access from their institution's repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications. Embargo period: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before an article becomes freely available to the public. This is the embargo period and it begins from the date the article is formally published online in its final and fully citable form. Find out more.

This journal has an embargo period of 24 months.
Elsevier Researcher Academy

Researcher Academy is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The "Learn" environment at Researcher Academy offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.

Language (usage and editing services)

Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from Elsevier's WebShop.

Submission of Manuscripts

Authors are requested to submit their papers electronically by using online manuscript submission available at https://ees.elsevier.com/ER. This site will guide authors stepwise through the submission process. Authors can upload their articles as Microsoft (MS) Word, WordPerfect, or LaTeX files. It is also possible to submit an article in PostScript or Adobe Acrobat PDF format, but if the article is accepted, the original source files will be needed. Zipped files containing individual files (letter to editor, manuscript, tables, figures) can also be downloaded and the online system will extract the files and allow them to be viewed and labeled. If you submit a word processing file, the system generates an Adobe Acrobat PDF version of the article for the reviewing process. Authors, reviewers, and editors send and receive all correspondence by e-mail and no paper correspondence is necessary. The manuscript will be edited according to the style of the journal, and authors must read the proofs carefully.

Online submissions require:

Cover Letter: Document (Word, WordPerfect, RTF, PDF, LaTex) containing your cover letter to the Editors. The following statement should be included in the letter to the editor: " All of the authors have read and approved the paper and it has not been published previously nor is it being considered by any other peer-reviewed journal."

Response to Reviews (Resubmissions Only): Document (Word, WordPerfect, RTF, PDF, LaTex) detailing your response to the reviewers' and editor's comments of a previously rejected manuscript that you are re-submitting.

Manuscript: Single word processing (Word, WordPerfect, RTF) or LaTeX file consisting of the title page, abstract, manuscript text, and any figure/table legends.
Manuscript file should include page numbers. Please do not include line numbering as this is automatically imposed by the editorial system.

Tables: Tables should be separate from the manuscript text, and can be uploaded individually or consolidated into a single file. The file description you input below when uploading your table must include the table number or range (e.g. Table 1, Tables 2-4).

Manuscripts must be written in English. There are no submission fees or page charges. Manuscripts are accepted for review with the understanding that no substantial portion of the study has been published or is under consideration for publication elsewhere and that its submission for publication has been approved by all of the authors and by the institution where the work was carried out; further, that any person cited as a source of personal communication has approved such a citation. Written authorization may be required at the Editor's discretion. All papers reporting on studies involving human subjects must include documentation that the study was reviewed and approved, prior to its conduct, by an appropriate institutional review board for human subjects research. No exceptions will be made to this requirement. Manuscripts that do not meet the general criteria or standards for publication in Environmental Research will be immediately returned to the authors without detailed review.

Environmental Research does not publish proceedings or abstracts from scientific meetings. However, the journal welcomes submissions of papers from a specific meeting under the following conditions: 1) all papers must be peer-reviewed by the journal; 2) the decision of the editors for publishing papers is final; 3) proposals for publishing such papers must be submitted in advance of the meeting;
4) the proposers must undertake preliminary review and selection of papers for submission to the Journal; and 5) these papers must be submitted as a group or within a period of three months to ensure timely and coordinated publication.

**Letters to the Editor**

Letters to the Editor (LTEs) are only published extraordinarily and in relation with very special topics. They are passed to external review only after a previous contact with the Editor-in-Chief, who will decide rapidly on the potential interest of the LTE for the readers of the Journal.

**PREPARATION**

**NEW SUBMISSIONS**

Submission to this journal proceeds totally online and you will be guided stepwise through the creation and uploading of your files. The system automatically converts your files to a single PDF file, which is used in the peer-review process. As part of the Your Paper Your Way service, you may choose to submit your manuscript as a single file to be used in the refereeing process. This can be a PDF file or a Word document, in any format or layout that can be used by referees to evaluate your manuscript. It should contain high enough quality figures for refereeing. If you prefer to do so, you may still provide all or some of the source files at the initial submission. Please note that individual figure files larger than 10 MB must be uploaded separately.

**References**

There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct.

**Formatting requirements**

There are no strict formatting requirements but all manuscripts must contain the essential elements needed to convey your manuscript, for example Abstract, Keywords, Introduction, Materials and Methods, Results, Conclusions, Artwork and Tables with Captions. If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes.

Divide the article into clearly defined sections.

**Figures and tables embedded in text**

Please ensure the figures and the tables included in the single file are placed next to the relevant text in the manuscript, rather than at the bottom or the top of the file. The corresponding caption should be placed directly below the figure or table.

**Peer review**

This journal operates a single blind review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. More information on types of peer review.

**REVISED SUBMISSIONS**

**Use of word processing software**

Regardless of the file format of the original submission, at revision you must provide us with an editable file of the entire article. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

**LaTeX**

You are recommended to use the Elsevier article class elsarticle.cls to prepare your manuscript and BibTeX to generate your bibliography.
Our LaTeX site has detailed submission instructions, templates and other information.

**Article structure**

For original full-length and short communications:
*Introduction* should be as concise as possible, without subheadings.

*Materials and methods* should be sufficiently detailed to enable the experiments to be reproduced.

*Results and Discussion* may be combined and may be organized into subheadings.

For commentaries and articles related to environmental policy, alternate formats will be accepted but should include an Introduction describing the problem in terms that a general reader will understand. All statements of fact need to be referenced and papers that make use of newly acquired data must include a Materials and methods section as well as a Results and Discussion section.

**Subdivision - numbered sections**

Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

*Introduction*

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

*Material and methods*

Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

*Results*

Results should be clear and concise.

*Discussion*

This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

*Conclusions*

The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

*Appendices*

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

**Essential title page information**

- **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
- **Author names and affiliations.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
- **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. This responsibility includes answering any future queries about Methodology and Materials. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.**
• **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Please note that the Journal's online editorial system (EES) now offers automatic line numbering.

Page 1 should contain the article title, the names and affiliations of all authors, and the name, telephone and fax numbers, e-mail address, and complete mailing address of the person to whom all correspondence should be sent.

Page 2 should contain an abstract and five descriptive keywords.

Page 3 provides information on funding sources supporting the work described in the manuscript. For all papers dealing with research or studies on human subjects or experimental animals, evidence must be provided of review and approval by an appropriately constituted committee for human subjects or animal research. If this information is not provided upon submission, the paper will be returned without review.

For original full-length and short communications: 
*Introduction* should be as concise as possible, without subheadings.

*Materials and methods* should be sufficiently detailed to enable the experiments to be reproduced or the study design to be understood fully.

*Results and Discussion* may be combined and may be organized into subheadings.

For commentaries and articles related to environmental policy, alternate formats will be accepted but should include an Introduction describing the problem in terms that a general reader will understand. All statements of fact need to be referenced and papers that make use of newly acquired data must include a Materials and methods section as well as a Results and Discussion section.

**Abstract**

A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

**Graphical abstract**

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view Example Graphical Abstracts on our information site.

Authors can make use of Elsevier's Illustration Services to ensure the best presentation of their images and in accordance with all technical requirements.

**Highlights**

Highlights are mandatory for this journal. They consist of a short collection of bullet points that convey the core findings of the article and should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point). You can view example Highlights on our information site.

**Keywords**

Immediately after the abstract, provide a maximum of 5 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, "and", "of"). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.
Abbreviations
Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

Abbreviations should follow the usage established by Chemical Abstracts. Please restrict the use of acronyms, especially non-standard ones, as much as possible.

Acknowledgements
Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Acknowledgements should be brief and should precede the references. In agreement with the Commission on Publication Ethics, authors must submit full information on sources of funding and other support for their work that is presented in their paper.

Formatting of funding sources
List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Math formulae
Please submit math equations as editable text and not as images. Present simple formulae in line with normal text where possible and use the solidus (/) instead of a horizontal line for small fractional terms, e.g., X/Y. In principle, variables are to be presented in italics. Powers of e are often more conveniently denoted by exp. Number consecutively any equations that have to be displayed separately from the text (if referred to explicitly in the text).

Footnotes
Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article.

Artwork
Electronic artwork
General points
• Make sure you use uniform lettering and sizing of your original artwork.
• Preferred fonts: Arial (or Helvetica), Times New Roman (or Times), Symbol, Courier.
• Number the illustrations according to their sequence in the text.
• Use a logical naming convention for your artwork files.
• Indicate per figure if it is a single, 1.5 or 2-column fitting image.
• For Word submissions only, you may still provide figures and their captions, and tables within a single file at the revision stage.
• Please note that individual figure files larger than 10 MB must be provided in separate source files.

A detailed guide on electronic artwork is available.

You are urged to visit this site; some excerpts from the detailed information are given here.

Formats
Regardless of the application used, when your electronic artwork is finalized, please 'save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):
EPS (or PDF): Vector drawings. Embed the font or save the text as 'graphics'.
TIFF (or JPEG): Color or grayscale photographs (halftones): always use a minimum of 300 dpi.
TIFF (or JPEG): Bitmapped line drawings: use a minimum of 1000 dpi.
TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale): a minimum of 500 dpi is required.

Please do not:
- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); the resolution is too low.
- Supply files that are too low in resolution.
- Submit graphics that are disproportionately large for the content.

Color artwork
Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article. Please indicate your preference for color: in print or online only. Further information on the preparation of electronic artwork.

Figure captions
Ensure that each illustration has a caption. A caption should comprise a brief title (not on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Tables
Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

References
Citation in text
Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Reference links
Increased discoverability of research and high quality peer review are ensured by online links to the sources cited. In order to allow us to create links to abstracting and indexing services, such as Scopus, CrossRef and PubMed, please ensure that data provided in the references are correct. Please note that incorrect surnames, journal/book titles, publication year and pagination may prevent link creation. When copying references, please be careful as they may already contain errors. Use of the DOI is encouraged.

A DOI can be used to cite and link to electronic articles where an article is in-press and full citation details are not yet known, but the article is available online. A DOI is guaranteed never to change, so you can use it as a permanent link to any electronic article. An example of a citation usingDOI for an article not yet in an issue is: VanDecar J.C., Russo R.M., James D.E., Ambeh W.B., Franke M. (2003). Aseismic continuation of the Lesser Antilles slab beneath northeastern Venezuela. Journal of Geophysical Research, https://doi.org/10.1029/2001JB000884. Please note the format of such citations should be in the same style as all other references in the paper.

Web references
As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.
Data references
This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

References in a special issue
Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference management software
Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley and Zotero, as well as EndNote. Using the word processor plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide.

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:
http://open.mendeley.com/use-citation-style/environmental-research
When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.

Reference formatting
There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct. If you do wish to format the references yourself they should be arranged according to the following examples:

Reference style
References should be cited in the text by the author's name and year of publication. References should be listed alphabetically in an unnumbered list at the end of the paper in the following style:


References drawn from the worldwide web must include the date in which the material was accessed.

The names of journals should be abbreviated according to the latest available edition of Index Medicus or Chemical Abstracts Service Source Index. Only articles that have been published or are in press should be included in the references. "Manuscript in preparation," "personal communication," and "unpublished observation" should be cited as such in the text.

Journal abbreviations source
Journal names should be abbreviated according to the List of Title Word Abbreviations.

Only articles that have been published or are in press should be included in the references. "Manuscript in preparation," "personal communication," and "unpublished observation" should be cited as such in the text.
Video
Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file's content. In order to ensure that your video or animation material is directly usable, please provide the file in one of our recommended file formats with a preferred maximum size of 150 MB per file, 1 GB in total. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect. Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our video instruction pages. Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

AudioSlides
The journal encourages authors to create an AudioSlides presentation with their published article. AudioSlides are brief, webinar-style presentations that are shown next to the online article on ScienceDirect. This gives authors the opportunity to summarize their research in their own words and to help readers understand what the paper is about. More information and examples are available. Authors of this journal will automatically receive an invitation e-mail to create an AudioSlides presentation after acceptance of their paper.

Data visualization
Include interactive data visualizations in your publication and let your readers interact and engage more closely with your research. Follow the instructions here to find out about available data visualization options and how to include them with your article.

Supplementary material
Supplementary material such as applications, images and sound clips, can be published with your article to enhance it. Submitted supplementary items are published exactly as they are received (Excel or PowerPoint files will appear as such online). Please submit your material together with the article and supply a concise, descriptive caption for each supplementary file. If you wish to make changes to supplementary material during any stage of the process, please make sure to provide an updated file. Do not annotate any corrections on a previous version. Please switch off the 'Track Changes' option in Microsoft Office files as these will appear in the published version.

Research data
This journal encourages and enables you to share data that supports your research publication where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods and other useful materials related to the project.

Below are a number of ways in which you can associate data with your article or make a statement about the availability of your data when submitting your manuscript. If you are sharing data in one of these ways, you are encouraged to cite the data in your manuscript and reference list. Please refer to the "References" section for more information about data citation. For more information on depositing, sharing and using research data and other relevant research materials, visit the research data page.

Data linking
If you have made your research data available in a data repository, you can link your article directly to the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with relevant repositories, giving readers access to underlying data that gives them a better understanding of the research described.

There are different ways to link your datasets to your article. When available, you can directly link your dataset to your article by providing the relevant information in the submission system. For more information, visit the database linking page.
For supported data repositories a repository banner will automatically appear next to your published article on ScienceDirect.

In addition, you can link to relevant data or entities through identifiers within the text of your manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053; PDB: 1XFN).

**Mendeley Data**
This journal supports Mendeley Data, enabling you to deposit any research data (including raw and processed data, video, code, software, algorithms, protocols, and methods) associated with your manuscript in a free-to-use, open access repository. During the submission process, after uploading your manuscript, you will have the opportunity to upload your relevant datasets directly to Mendeley Data. The datasets will be listed and directly accessible to readers next to your published article online.

For more information, visit the Mendeley Data for journals page.

**Data in Brief**
You have the option of converting any or all parts of your supplementary or additional raw data into one or multiple data articles, a new kind of article that houses and describes your data. Data articles ensure that your data is actively reviewed, curated, formatted, indexed, given a DOI and publicly available to all upon publication. You are encouraged to submit your article for Data in Brief as an additional item directly alongside the revised version of your manuscript. If your research article is accepted, your data article will automatically be transferred over to Data in Brief where it will be editorially reviewed and published in the open access data journal, Data in Brief. Please note an open access fee of 500 USD is payable for publication in Data in Brief. Full details can be found on the Data in Brief website. Please use this template to write your Data in Brief.

**MethodsX**
You have the option of converting relevant protocols and methods into one or multiple MethodsX articles, a new kind of article that describes the details of customized research methods. Many researchers spend a significant amount of time on developing methods to fit their specific needs or setting, but often without getting credit for this part of their work. MethodsX, an open access journal, now publishes this information in order to make it searchable, peer reviewed, citable and reproducible. Authors are encouraged to submit their MethodsX article as an additional item directly alongside the revised version of their manuscript. If your research article is accepted, your methods article will automatically be transferred over to MethodsX where it will be editorially reviewed. Please note an open access fee of 500 USD is payable for publication in MethodsX. Full details can be found on the MethodsX website. Please use this template to prepare your MethodsX article.

**Data statement**
To foster transparency, we encourage you to state the availability of your data in your submission. This may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you will have the opportunity to indicate why during the submission process, for example by stating that the research data is confidential. The statement will appear with your published article on ScienceDirect. For more information, visit the Data Statement page.

**AFTER ACCEPTANCE**

**Online proof correction**
Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors.

If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.

We will do everything possible to get your article published quickly and accurately. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. It is important to ensure that all corrections are sent back to us in one communication. Please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.
**Offprints**

The corresponding author will, at no cost, receive a customized Share Link providing 50 days free access to the final published version of the article on ScienceDirect. The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Both corresponding and co-authors may order offprints at any time via Elsevier's Webshop. Corresponding authors who have published their article open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.

**AUTHOR INQUIRIES**

Visit the Elsevier Support Center to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch. You can also check the status of your submitted article or find out when your accepted article will be published.

© Copyright 2018 Elsevier | https://www.elsevier.com