ENVIRONMENTAL MODELLING & SOFTWARE

AUTHOR INFORMATION PACK

TABLE OF CONTENTS

- Description p.1
- Impact Factor p.2
- Abstracting and Indexing p.3
- Editorial Board p.3
- Guide for Authors p.5

DESCRIPTION

*Environmental Modelling & Software* publishes contributions, in the form of research articles, reviews and short communications, on recent advances in *environmental modelling* and/or *software*. The aim is to improve our capacity to represent, understand, predict or manage the behaviour of *environmental systems* at all practical scales, and to communicate those improvements to a wide scientific and professional audience.

It seeks presentation of:
- Generic frameworks, techniques and issues which either integrate a range of disciplines and sectors or apply across a range
- **Model development**, model evaluation, process identification and applications in diverse sectors of the environment (as outlined below) provided they reveal insights and contribute to the store of knowledge. Insights can relate to the generality and limitations of the modelling, methods, the model application and/or the systems modelled. Insights should be ones that are generalizable in some way and are likely to be of interest to those studying other systems and, preferably, other system types.
- Development and application of *environmental software*, information and decision support systems
- Real-world applications of software technologies - particularly state-of-the-art environmental software able to deal with complex requirements, conflicting user perspectives, and/or evolving data structures. Aspects related to software usability, reliability, verification and validation should be backed up with quantitative results as much as possible. Development and maintenance costs, and adoption and penetration of the software in the target user groups should be addressed. Licensing issues and open source access should be clearly specified.
- Issues and methods related to the integrated modeling, assessment and management of environmental systems - including relevant policy and institutional analysis, public participation principles and methods, decision making methods, model integration, quality assurance and evaluation of models, data and procedures.

Authors must specify clearly the objectives of their models and/or software, and report on the essential steps that were used in their development, normally including the rationale for the type of approach selected and substantial testing and evaluation of it - comparisons with alternative approaches and methods are encouraged. The purpose of this specification, evaluation and reporting is to convey the rigour and credibility of the work and therefore its potential to contribute to knowledge acquisition. To this latter end, authors are expected to briefly review and cite the historical progress made for their problem and clearly show how their work adds value to the literature.
The journal encourages submission of Short Communications of less than 3,000 words. For these and the regular papers, supplementary material such as software demonstrations, model simulations and additional performance tests, can be posted in electronic form and commented upon by users.

Authors are invited to submit relevant contributions in the following areas:

- Generic and pervasive frameworks, techniques and issues - including system identification theory and practice, model conception, model integration, model and/or software evaluation, sensitivity and uncertainty assessment, visualization, scale and regionalization issues.
- Integrated assessment and management of systems (river basins, regions etc.) for enhancing sustainability outcomes - including linked socioeconomic and biophysical models that may be developed with stakeholders for understanding systems, communication and learning, and improving system outcomes.
- Artificial Intelligence (AI) techniques and systems, such as knowledge-based systems / expert systems, case-based reasoning systems, data mining, multi-agent systems, Bayesian networks, artificial neural networks, fuzzy logic, or knowledge elicitation and knowledge acquisition methods.
- Decision support systems and environmental information systems - implementation and use of environmental data and models to support all phases and aspects of decision making, in particular supporting group and participatory decision making processes. Intelligent Environmental Decision Support Systems can include qualitative, quantitative, mathematical, statistical, AI models and meta-models.
- Process-identification of environmental dynamics for instance of surface and subsurface hydrology, limnology, meteorology, geophysics with special respect to the interaction of anthroposphere and biosphere.
- GIS, remote sensing and image processing

These methodological developments should be illustrated with applications in the environmental fields, e.g.

- Resource management including water, land, biological, transport systems
- Pollution of different media such as air, water, soil, noise, radiation, as well as multimedia problems
- Global pollution and global climate change
- Regional studies of resource consumption and/or nature conservation in open landscapes as well as in urban regions
- Environmental accidents, prevention and emergency response - resilience, vulnerability, self-repair, damage limitation, and security in infrastructures
- Environmental engineering and technology

*Environmental Modelling and Software* welcomes review articles on the topics above, especially ones that relate to generic modelling and/or software issues, or are cross-disciplinary in their problem treatment. Potential authors of review articles should contact either Dr Jakeman or Dr Rizzoli to discuss the topic and coverage of their review. The journal has also published several Position Papers on key topics within its aims and scope at [http://www.iemss.org/society/index.php/position-papers](http://www.iemss.org/society/index.php/position-papers)

Introductory Overviews are designed to provide a concise topic overview that caters to the eclectic readership of EMS. These articles aim to break down barriers to shared understanding and dialogue within multidisciplinary teams, and to make environmental modelling dimensions more accessible to a wider audience. Introductory Overviews include an introduction to the fundamentals of the topic and reference to key literature. Relevant concepts are presented in relatively simple terms, but with the audience assumed to have some basic knowledge of environmental modelling and mathematics. These articles are not intended to be comprehensive reviews but non-technical primers on essential modelling concepts. Introductory Overviews are peer reviewed and are by invitation only; ideas for Introductory Overviews can however be canvassed with any of the Editors.

**IMPACT FACTOR**

2016: 4.404 © Thomson Reuters Journal Citation Reports 2017
ABSTRACTING AND INDEXING

Elsevier BIOBASE
Computer Literature Index
Current Contents/Agriculture, Biology & Environmental Sciences
International Civil Engineering Abstracts
International Development Abstracts
Environmental Periodicals Bibliography
Geographical Abstracts: Human Geography
INSPEC
Research Alert
SCI Research
Science Citation Index
CompuMath Citation Index
SciSearch/Science Citation Index Expanded
Scopus
Journal Citation Reports - Science Edition

EDITORIAL BOARD

Editor-in-Chief
D.P. Ames, Brigham Young University, Provo, Utah, USA

Honorary Editor-in-Chief
A.J. Jakeman, Australian National University, Canberra, Australian Capital Territory, Australia

Editors
I.N. Athanasiadis, Wageningen University, Netherlands
S. Reis, Centre for Ecology & Hydrology (CEH), Edinburgh, UK
A.E. Rizzoli, Dalle Molle Institute for Artificial Intelligence (IDSIA), Manno (Lugano), Switzerland
A. Voinov, International Inst. for Geo-Information Science & Earth Observation (ITC), Enschede, Netherlands

Associate Editors
T. Berger, Universität Hohenheim, Stuttgart, Germany
M. Borsuk, Dartmouth College, Hanover, New Hampshire, USA
A. Castelletti, Politecnico di Milano, Milano, Italy
M. Donatelli, Council for Agricultural Research and Economics (CREA), Bologna, Italy
G. Guariso, Politecnico di Milano, Milano, Italy
A. Jolma, Finnish Environment Institute (SYKE), Helsinki, Finland
H.R. Maier, University of Adelaide, Adelaide, South Australia, Australia
S. Marsili-Libelli, Università degli Studi di Firenze, Firenze, Italy
B. Robson, CSIRO (The Commonwealth Scientific and Industrial Research Organization), Canberra, Australian Capital Territory, Australia
M. Sànchez-Marrè, Universitat Politècnica de Catalunya (UPC), Barcelona, Catalonia, Spain
R. Seppelt, Helmholtz Centre for Environmental Research - UFZ, Leipzig, and Martin-Luther-Universitaet, Halle-Wittenberg, Germany

Emeritus Editor
A.A. Jennings, Case Western Reserve University, Cleveland, Ohio, USA

Editorial Board
M. Acutis, Facoltà di Agraria, Milano, Italy
K. Alexandridis, University of the Virgin Islands, St. Thomas, Virgin Islands, U.S.
R.M. Argent, Bureau of Meteorology, Melbourne, Victoria, Australia
L. Bernard, Technische Universität Dresden, Dresden, Germany
J. Coen, National Center for Atmospheric Research, Boulder, Colorado, USA
O. David, Colorado State University, Fort Collins, Colorado, USA
I. Demir, University of Iowa, Iowa City, Iowa, USA
R. Denzer, Hochschule für Technik und Wirtschaft des Saarlandes, Saarbrücken, Germany
Q. Duan, Beijing Normal University, Beijing, China
A. Ernest, The University of Texas Rio Grande Valley, Edinburg, Texas, USA
T. Filatova, University of Twente, Enschede, Netherlands
S. Galelli, Singapore University of Technology and Design, Singapore
C. Giupponi, Università Ca’ Foscari Venezia, Venezia, Italy
J.L. Goodall, University of Virginia, Charlottesville, Virginia, USA
T.R. Green, U.S. Department of Agriculture (USDA), Fort Collins, Colorado, USA
C. Gualtieri, University of Naples Federico II, Napoli, Italy
J. Guillaume, Aalto University, Espoo, Finland
M.C. Hill, University of Kansas, Lawrence, Kansas, USA
M.R. Hipsey, University of Western Australia, Perth, Western Australia, Australia
B. Hodges, University of Texas at Austin, Austin, Texas, USA
A. Holzkaemper, AGROSCOPE, Zürich, Switzerland
R.J. Hunt, U.S. Geological Survey (USGS), Middleton, Wisconsin, USA
A.V.M. Ines, Columbia University, Palisades, New York, USA
G. Iovine, National Research Council of Italy (CNR), Cosenza, Italy
D. Karssenberg, Utrecht University, Utrecht, Netherlands
K.J. Keesman, Wageningen University, Wageningen, Netherlands
T. Kokkonen, Aalto University, Espoo, Finland
L. Marshall, UNSW Australia, Sydney, New South Wales, Australia
R. Oglesby, University of Nebraska, Lincoln, NE, USA
G. Petropoulos, Aberystwyth University, Aberystwyth, UK
S.A. Pierce, University of Texas at Austin, Austin, Texas, USA
N.W.T. Quinn, Lawrence Berkeley National Laboratory, Berkeley, California, USA
M. Ratto, European Commission Joint Research Centre (JRC), Ispra, Italy
S. Razavi, University of Saskatchewan, Saskatoon, Saskatchewan, Canada
P. Reed, Cornell University, Ithaca, New York, USA
J.-D. Rinaudo, BRGM, Montpellier, France
C. Smith, University of Queensland, Brisbane, Queensland, Australia
V. Snow, AgResearch, Lincoln, New Zealand
C.J. Taylor, Lancaster University, Lancaster, England, UK
A. van Griensven, UNESCO-IHE Institute for Water Education, Delft, Netherlands
P.A. Vanrolleghem, Université Laval, Laval, Quebec, Canada
I. Vardavas, University of Crete, Crete, Greece
P.H. Verburg, VU University Amsterdam, The Netherlands
W Vervoort, The University of Sydney, Eveleigh, New South Wales, Australia
K. Voigt, Deutsches Forschungszentrum für Gesundheit und Umwelt, München, Germany
M. Volk, Helmholtz Centre for Environmental Research - UFZ, Leipzig, Germany
J. Vrugt, University of California at Irvine, Irvine, California, USA
Z.-L. Yang, University of Texas at Austin, Austin, Texas, 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 EMS

Rapid evaluation process: EMS has a rapid evaluation process in the first stage to assess if manuscripts warrant being sent out for full review. Submissions that have problems related to the following may be rejected outright and not considered for resubmission:
1. Topic and its treatment should be within the scope of the journal.
2. Presentation and good structure and grammar - manuscripts may need to be edited by a professional or native English speaker.
3. Citations in the text should be included in the Reference list and each reference in the list should be complete in detail and style.
4. Adequate coverage of the literature through the references, especially more recent articles, including those in the Environmental Modelling and Software Journal.
5. The mathematics should be clear and all variables explained/defined.
6. Figures and tables should be of good quality, and must be embedded in the text as well as uploaded separately.
7. Model and/or software evaluation and testing must be adequate.
8. A Software Availability Section must be included if relevant

Types of paper
Types of Contributions: Research articles, review papers, short communications, commentaries, and book reviews.

Research articles are archival, high quality research contributions that improve the state of the art on topics treated by the journal. The work reported needs to be technically sound and sufficiently unique, with the mathematical (algorithmic) foundations of models or software need to be properly documented. It is important to report on model or software performance against data and other considerations, and the relevance to user needs.

Review papers provide an extensive overview of recent developments in specific areas that fall within the scope of the journal. They are expected to have an extensive literature review followed by an in-depth analysis of the state of the art, and identify challenges for future research.

Position papers position Papers aim to synthesize some key aspect of the knowledge platform for environmental modelling and software issues. The review process is twofold following a diverse collaborative effort - a normal external review process and an extensive review by EMS Board members.

Commentaries are short articles commenting on previously published work in Environmental Modelling and Software and on topics of interest to the wide readership. They can be submitted after discussion with the Editor-in-Chief.

Short communications are concise articles that are no longer than 3000 words (7-8 double spaced pages). They aim to report new ideas, recent advances in modelling and software. Short communications do not cover in detail background information about the problems treated or the applications, rather they provide key pointers to the reader. The work reported needs to be technically sound, innovative and significantly unique, advancing the state of the art. Our intent is to keep the review time for ShortComs short (ideally less than a month) to make sure that your new ideas get disseminated as fast as possible. Authors must include a statement about the word count in their submission.

Book reviews are short articles that introduce new books in the areas relevant for the journal audience. In particular we are interested in covering books that can be used for teaching environmental modelling and software topics.
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](https://www.elsevier.com/locate/envsoft).

**BEFORE YOU BEGIN**

**Ethics in publishing**
Please see our information pages on [Ethics in publishing](https://www.elsevier.com/locate/envsoft) and [Ethical guidelines for journal publication](https://www.elsevier.com/locate/envsoft).

**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. If there are no conflicts of interest then please state this: 'Conflicts of interest: none'. [More information](https://www.elsevier.com/locate/envsoft).

**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 [CrossCheck](https://www.elsevier.com/locate/envsoft).

**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.

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 3100, excluding taxes. Learn more about Elsevier's pricing policy: http://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 Publishing Campus
The Elsevier Publishing Campus (www.publishingcampus.com) is an online platform offering free lectures, interactive training and professional advice to support you in publishing your research. The College of Skills training offers modules on how to prepare, write and structure your article and explains how editors will look at your paper when it is submitted for publication. Use these resources, and more, to ensure that your submission will be the best that you can make it.

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
Our online submission system guides you stepwise through the process of entering your article details and uploading your files. The system converts your article files to a single PDF file used in the peer-review process. Editable files (e.g., Word, LaTeX) are required to typeset your article for final publication. All correspondence, including notification of the Editor's decision and requests for revision, is sent by e-mail.

Referees
All manuscripts are sent to at least two independent reviewers to ensure both accuracy and relevance to the journal. Authors should therefore provide the names of up to 5 potential reviewers upon submission.

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
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.

General structure
Title, Authors, Affiliations and Contact details Abstract Keywords Software and/or data availability Introduction Material and methods Results Discussion Conclusions Acknowledgements References Appendices

Essential title page information
• **Title.** Concise and informative. Titles are often used in information-retrieval systems. Omit names of models and software. Avoid abbreviations and formulae where possible.
• **Author names and affiliations.** Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. 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. **Ensure that telephone and fax numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address. Contact details must be 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.

**Authorship**

Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors. Acknowledgement of the contributions of authors is encouraged (see Acknowledgements section below). The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

**Abstract**

A concise and factual abstract is required, with a restriction of 150 words. 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**

A Graphical abstract is optional and should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership online. Authors must provide images that clearly represent the work described in the article. 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. See [http://www.elsevier.com/graphicalabstracts](http://www.elsevier.com/graphicalabstracts) for examples.

Authors can make use of Elsevier's Illustration and Enhancement service to ensure the best presentation of their images also in accordance with all technical requirements: [Illustration Service](http://www.elsevier.com/illustration-enhancement).

**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 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). See [http://www.elsevier.com/highlights](http://www.elsevier.com/highlights) for examples.

**Keywords**

Immediately after the abstract, provide a maximum of 6 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.

**Software and/or data availability section**

Where appropriate, a software/data availability section should be provided, containing as much of the following information as possible: name of software or data set, developer and contact address, telephone, fax and e-mail numbers, year first available, hardware required, software required, availability and cost. Also for software: program language, program size; for data: form of repository (data base, files, spreadsheet), size of archive, access form.

When a software component is an essential part of the paper presentation, authors should be prepared to make it available to reviewers during the review process. To preserve the anonymity of reviewers, the authors should make the software available for a download, protecting it if needed by a password that is communicated to the editors.
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 detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should 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.

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.

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.). We encourage the inclusion of a brief outline of the contributions of authors in this section, for example: "Author contributions: T.L., E.K. and H.S. designed the research; T.L., E.K., W.L. and H.S. performed the research; T.L. and E.K. analysed the data; and T.L., W.L. and H.S. wrote the paper." Other contribution categories may include model coding, programming support, research conception, etc.

Formatting
The manuscript should be prepared as single column text, with 11 or 12-pt standard font (e.g. Arial, Times New Roman) and 1.5 spacing. Page numbers must be inserted. Do not add line numbers to the manuscript file, as line numbers are added automatically when the submission is compiled.

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
AUTHORS MUST EMBED THEIR FIGURES IN THE MAIN TEXT AS WELL AS UPLOAD THEIR FIGURES AS SEPARATE FILES IN EES.

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 using DOI 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:
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
Text: All citations in the text should refer to:
1. Single author: the author's name (without initials, unless there is ambiguity) and the year of publication;
2. Two authors: both authors' names and the year of publication;
3. Three or more authors: first author's name followed by 'et al.' and the year of publication.

Citations may be made directly (or parenthetically). Groups of references should be listed first alphabetically, then chronologically.

Examples: 'as demonstrated (Allan, 2000a, 2000b, 1999; Allan and Jones, 1999). Kramer et al. (2010) have recently shown ....

List: References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication.

Examples:
Reference to a journal publication:
Reference to a book:
Reference to a chapter in an edited book:
Reference to a website:
Reference to a dataset:

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

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 files in one of our recommended file formats with a preferred maximum size of 150 MB in total. Any single file should not exceed 50 MB. 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.
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 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.

ARTICLE ENRICHMENTS
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.

Google Maps and KML files
KML (Keyhole Markup Language) files (optional): You can enrich your online articles by providing KML or KMZ files which will be visualized using Google maps. The KML or KMZ files can be uploaded in our online submission system. KML is an XML schema for expressing geographic annotation and visualization within Internet-based Earth browsers. Elsevier will generate Google Maps from the submitted KML files and include these in the article when published online. Submitted KML files will also be available for downloading from your online article on ScienceDirect. More information.

Interactive MATLAB Figure Viewer
This journal features the Interactive MATLAB Figure Viewer, allowing you to display figures created in MATLAB in the .FIG format in an interactive viewer next to the article. More information and submission instructions.

Interactive plots
This journal enables you to show an Interactive Plot with your article by simply submitting a data file. Full instructions.

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 2014 Elsevier | http://www.elsevier.com