RESOURCES, CONSERVATION & RECYCLING

TABLE OF CONTENTS

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

DESCRIPTION

Resources, Conservation & Recycling has an open access mirror journal Resources, Conservation & Recycling: X, sharing the same aims and scope, editorial team, submission system and rigorous peer review.

The Editors welcome contributions from research, which consider sustainable management and conservation of resources. The journal emphasizes the transformation processes involved in a transition toward more sustainable production and consumption systems. Emphasis is upon technological, economic, institutional and policy aspects of specific resource management practices, such as conservation, recycling and resource substitution, and of "systems-wide" strategies, such as resource productivity improvement, the restructuring of production and consumption profiles and the transformation of industry.

Contributions may have relevance at regional, national or international scales and may focus at any level of research from individual resources or technologies to whole sectors or systems of interest. Contributors may emphasise any of the aforementioned aspects as well as scientific and methodological issues. However, manuscripts that consider only laboratory experiments, without a discussion of the practical, environmental and economic implications of the presented research, are excluded from publication in the journal.

The journal publishes papers, reviews, analyses and case studies on topics, which include:
• Transformation of the industrial and societal system towards more sustainable production and consumption patterns, including management, instruments, methods and processes of change.
• Information and management systems involving resource status, use and material flows in society.
• Innovation processes, tools and methods relating to resource productivity improvement.
• Technical, societal, economic, business and policy aspects of strategies to improve the sustainability and productivity of resource use, including strategies for managing resource supply and demand, valorizing waste, lowering energy and material intensities and increasing the serviceability of products.
• Substitution of primary resources by renewable or regenerative alternatives, including agricultural and forest resources and wastes.
• Material flow analysis and the understanding of resource use and flows in society and the impact on the environment, including resource extraction and waste generation.
• Life cycle assessment and management of resources, materials and products to improve resource efficiency and productivity, conserve resources and reduce pollution.
• Societal, economic and technological change for improved recovery and reuse of materials and energy from domestic, commercial or industrial waste streams.
• Efficient management and use of all resources, including air and water, with regard to the qualitative as well as quantitative aspects of resource use.

AUDIENCE

Environmental scientists, engineers, managers and economists; policy makers; corporate strategists, business decision makers; design engineers; systems analysts; members of NGOs interested in environmental and developmental issues; and those interested in industrial transformation and the management of change.

IMPACT FACTOR

2018: 7.044 © Clarivate Analytics Journal Citation Reports 2019

ABSTRACTING AND INDEXING

Fuel and Energy Recycling
EIC/Intelligence
Engineering Village - GEOBASE
BIOSIS Citation Index
Chemical Abstracts
Coal Abstracts
Coal Data Base (IEA)
Computer Contents
Current Contents
Energy Information Abstracts
Engineering Index
Environmental Abstracts
Environmental Health & Pollution Control
Environmental Periodicals Bibliography
Embase
Pascal Francis
Waste Management Information Bulletin
World Aluminum Abstracts
Engineered Materials Abstracts
Materials Business Information
Metals Abstracts
Scopus
Chemical Engineering Abstracts
Elsevier BIOBASE
Science Citation Index Expanded
INSPEC

EDITORIAL BOARD

Editor-in-Chief
Ming Xu, University of Michigan, Ann Arbor, Michigan, United States
Life cycle assessment, Environmental footprint

Associate Editors
Fazleena Badurdeen, University of Kentucky, Lexington, Kentucky, United States
Sustainable Manufacturing, Sustainable supply chains
Wei-Qiang Chen, Institute of Urban Environment Chinese Academy of Sciences, Xiamen, China
Urban Sustainability, Industrial Ecology, Material Flow Analysis
Steven De Meester, Ghent University, Gent, Belgium
Recycling technologies for plastics and organic waste, Material flow analysis, Chemical engineering in the circular economy

Xiangzheng Deng, Institute of Geographic Sciences and Natural Resources Research Chinese Academy of Sciences, Beijing, China

Environmental and Natural Resource Economics; Land Change Science; Agricultural Policy and Sustainable Development; Water Management and Water Footprint; Ecosystem Services and Functions; Urbanization and Global Environment Change; Energy Economics and climate Policy; Sustainability-based Decision Making

Vikas Khanna, University of Pittsburgh, Pittsburgh, Pennsylvania, United States
Life cycle assessment, Input-output analysis, Complex systems, Industrial ecology

Junbeum Kim, University of Applied Sciences Troyes, Troyes, France
Industrial ecology, Life cycle assessment, Material & waste flow analysis and management, Emerging waste

Gang Liu, University of Southern Denmark, Odense, Denmark
Material flow analysis, Urban metabolism, Industrial ecology, Sustainable agrifood system, Built environment stocks

Keisuke NANSAI, National Institute for Environmental Studies, Ibaraki, Japan
Input-output analysis, Life cycle assessment, Material flow analysis, Sustainable supply-chain, Material criticality

Sergio Pacca, University of Sao Paulo, São Paulo, Brazil
Life cycle assessment, MFA, I-O, Construction, Biofuels

Joseph Sarkis, Worcester Polytechnic Institute, Worcester, Massachusetts, United States
Green and Sustainable Supply Chains, Circular Economy, Business and the Natural Environment, Technology and Innovation

Timothy Townsend, University of Florida, Gainesville, Florida, United States
Solid waste; recycling; sustainable materials management; beneficial use; hazardous waste

Yufeng Wu, Beijing University of Technology, Beijing, China

William Young, University of Leeds, Leeds, United Kingdom
Pro-environmental behaviour, Product sustainability standards, Corporate sustainability strategies

Managing Editor
Shen Qu, University of Michigan, Ann Arbor, Michigan, United States
Trade and the environment; Urban food-water-energy nexus; Water risk; Sustainable production and consumption

Assistant Editor
Y. Gu, Beijing University of Technology, Beijing, China

Editorial Board
Julian Allwood, University of Cambridge, Cambridge, United Kingdom

Sergio Angulo, University of Sao Paulo, São Paulo, Brazil
construction and demolition waste; recycling; building materials

Robert U. Ayres, European Institution for Administration and Affairs, Fontainebleau, France

Callie Babbitt, Rochester Institute of Technology, Rochester, New York, United States
Chunguang Bai, University of Electronic Science and Technology of China, Chengdu, China
Sustainability; Operation management; Supply chain management; The nature environment;Management of technology

Jeroen van den Bergh, Autonomous University of Barcelona Institute of Environmental Science and Technology, Bellaterra, Spain
Environmental and resource economics. Energy and climate economics. Environmental science and ecological economics. Evolutionary economics and innovation studies. Spatial (regional, transport and urban) economics

Jorge de Brito, University of Lisbon Higher Technical Institute, Lisboa, Portugal
Sustainable construction, eco-efficient concrete, eco-efficient mortars, recycled aggregates, supplementary cementitious materials

Paul Brunner, TU Wien University, Wien, Austria

Jo Dewulf, Ghent University, Gent, Belgium

Matthew Eckelman, Northeastern University, Boston, Massachusetts, United States
Environmental engineering, Life cycle assessment, Urban infrastructure

Peter Giavic, University of Maribor, Maribor, Slovenia

Thomas Graedel, Yale University, New Haven, Connecticut, United States

Seiji Hashimoto, Ritsumeikan University - Biwako Kusatsu Campus, Kusatsu, Japan

Gang He, Stony Brook University, Stony Brook, New York, United States
Monzur Imteaz, Swinburne University of Technology Department of Civil and Construction Engineering, Melbourne, Victoria, Australia
Water conservation, recycling, water modelling, environmental modelling

Ramzy Kahhat, Pontifical Catholic University of Peru, Lima, Peru

Kannan Govindan, University of Southern Denmark, Odense, Denmark

Alissa Kendall, University of California System, Oakland, California, United States
Transportation and Energy Engineering and Industrial Ecology

Jiří Jaromír Klemeš, Brno University of Technology, Brno, Czech Republic
Cleaner Production and Technical Processes; Green/sustainable engineering; Green/sustainable supply chains; Biomass; Energy use and consumption; Waste minimisation; Pollution reduction; Renewable energy; Environmental assessment; Emergy/exergy analyses; LCA of product and process - Footprints and other assessment types; Supply chains (modelling, mathematical, and engineering); Eco-industrial parks; Energy-water nexus

Yasushi Kondo, Waseda University, Shinjuku-Ku, Japan

Simonov Kusi-Sarpong, University of Portsmouth, Portsmouth, United Kingdom
Sustainability, Green Supply Chains, Circular Economy, Industry 4.0, Operational Excellence

Ming K. Lim, Chongqing University, Chongqing, China
Sustainable Supply Chain, Green Logistics, Green IoT, Big Data Analytics, Artificial Intelligence

Ruiping Liu, Chinese Academy of Sciences, Beijing, China
Drinking water treatment and endemic diseases control; Water treatment technologies and systems optimization; Hazardous wastes disposal and reclamation; Heavy metals pollution control.

Rui Cunha Marques, University of Lisbon, Lisbon, Portugal

Eric Masanet, Northwestern University, Evanston, Illinois, United States

Ming-hung Wong, Hong Kong Baptist University Croucher Institute for Environmental Sciences, Hong Kong, Hong Kong

Daniel Beat Müller, Norwegian University of Science and Technology, Trondheim, Norway

Shinichiro Nakamura, Waseda University, Shinjuku-Ku, Japan
Industrial ecology, input-output analysis, waste management, material flow analysis

Martin Patel, University of Geneva, Geneva, Switzerland
Energy efficiency, emission reduction, energy storage, buildings, industry

José Potting, Netherlands Environmental Assessment Agency Location Bilthoven, Sweden

Helmut Rechberger, TU Wien University, Wien, Austria

Vasco Sanchez Rodrigues, Cardiff University, Cardiff, United Kingdom
Green supply chains, green logistics, food waste mitigation, supply chain collaboration and circular supply chains

Heinz Schandl, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia

Roland Scholz, Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB, Stuttgart, Germany

Susan Selke, Michigan State University, East Lansing, Michigan, United States

Lei Shen, Chinese Academy of Sciences, Beijing, China

Anthony Shun Fung Chiu, De la Salle University, Manila, Philippines

Rafat Siddique, Thapar University, Inst. of Engineering & Technology (Deemed University), Patiala, India
Recycling, Industrial By-products, Sustainable Construction Materials, Waste Utilization

Guido Sonnemann, University of Bordeaux, Bordeaux, France

Valerie Thomas, Georgia Institute of Technology, Atlanta, Georgia, United States

Jinping Tian, Tsinghua University, Beijing, China

Ming Lang Tseng, Lunghwa University of Science and Technology, Guishan, Taiwan

Ernst Worrell, Utrecht University, Utrecht, Netherlands

Beidou Xi, Chinese Research Academy of Environmental Sciences, Beijing, China
Solid waste treatment and recycling, Groundwater pollution prevention and control

Zhifeng Yang, Guangdong University of Technology Institute of Environmental and Ecological Engineering, Guangzhou, China

Lixiao Zhang, Beijing Normal University, Beijing, China

Tieyong Zuo, Beijing University of Technology, Beijing, China
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
PLEASE FOLLOW THESE INSTRUCTIONS CAREFULLY TO ENSURE THAT THE REVIEW AND PUBLICATION OF YOUR ARTICLE IS AS SWIFT AND EFFICIENT AS POSSIBLE. THESE NOTES MAY BE COPIED FREELY.

Aims and Scope The Editors welcome contributions from research, which consider sustainable management and conservation of resources. The journal emphasizes the transformation processes involved in a transition toward more sustainable production and consumption systems. Emphasis is upon technological, economic, institutional and policy aspects of specific resource management practices, such as conservation, recycling and resource substitution, and of "systems-wide" strategies, such as resource productivity improvement, the restructuring of production and consumption profiles and the transformation of industry. Contributions may have relevance at regional, national or international scales and may focus at any level of research from individual resources or technologies to whole sectors or systems of interest. Contributors may emphasize any of the aforementioned aspects as well as scientific and methodological issues. However, manuscripts that consider only the technological aspect of resource management (e.g., laboratory experiments), are excluded from publication in the journal.

The journal publishes original research articles, reviews, and perspectives from the following areas:
Transformation of the industrial and societal system towards more sustainable production and consumption patterns, including management, instruments, methods and processes of change. Information and management systems involving resource status, use and material flows in society. Innovation processes, tools and methods relating to resource productivity improvement. Technical, societal, economic, business and policy aspects of strategies to improve the sustainability and productivity of resource use, including strategies for managing resource supply and demand, valorizing waste, lowering energy and material intensities and increasing the serviceability of products. Substitution of primary resources by renewable or regenerative alternatives, including agricultural and forest resources and wastes. Understanding of resource use and flows in society and the impact on the environment, including resource extraction and waste generation. Life cycle analysis and management of resources, materials and products to improve resource efficiency and productivity, conserve resources and reduce pollution. Societal, economic and technological change for improved recovery and reuse of materials and energy from domestic, commercial or industrial waste streams. Efficient management and use of all resources, including air and water, with regard to the qualitative as well as quantitative aspects of resource use. Theories, frameworks, analyses, and practices of circular economy.

Types of Papers
Original research articles. These articles report original research with broad scientific significance and importance.

Review. These papers provide extensive overview and thorough assessment of recent developments in selected areas that fall within the aims and scope of the Journal.

Perspective. These short papers with an "op-ed" style allow authors to comment on issues of broad implications and pressing importance to sustainable management and conservation of resources. Perspective papers are integrated pieces without an abstract, sections and headlines. Perspective papers are generally not peer reviewed and subject to editorial approval. However, Perspective papers with significant technical information may be peer reviewed at the discretion of the editors.

Word limit
Word limit of manuscripts is calculated based on the main body of the paper excluding title, author and affiliations, abstract, keywords, acknowledgement, and references. Original Research Article: 7,000 words for the manuscript and 250 words for the abstract. Review: 9,000 words for the manuscript and 250 words for the abstract. Perspective: 1,200 words with no more than one figure or table and up to five references, no abstract.

**Number of figures/tables**
Authors are suggested to include approximately five to six key figures/tables in the manuscript for Original Research Article and Review. Additional figures/tables that are relevant to the paper can be provided as appendices. A Perspective paper can include up to one figure or table.

**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 should complete the declaration of interest statement using this template and upload to the submission system at the Attach/Upload Files step. If there are no interests to declare, please choose: 'Declarations of interest: none' in the template. This statement will be published within the article if accepted. More information.

**Preprints**
Please note that preprints can be shared anywhere at any time, in line with Elsevier's sharing policy. Sharing your preprints e.g. on a preprint server will not count as prior publication (see 'Multiple, redundant or concurrent publication' for more information).

**Use of inclusive language**
Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Articles should make no assumptions about the beliefs or commitments of any reader, should contain nothing which might imply that one individual is superior to another on the grounds of race, sex, culture or any other characteristic, and should use inclusive language throughout. Authors should ensure that writing is free from bias, for instance by using 'he or she', 'his/her' instead of 'he' or 'his', and by making use of job titles that are free of stereotyping (e.g. 'chairperson' instead of 'chairman' and 'flight attendant' instead of 'stewardess').

**Author contributions**
For transparency, we encourage authors to submit an author statement file outlining their individual contributions to the paper using the relevant CRediT roles: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; Writing - review & editing. Authorship statements should be formatted with the names of authors first and CRediT role(s) following. More details and an example

**Open access**
Please visit our Open Access page for more information.

**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.

**Cover Letter**
A cover letter must be provided for each submission and include a rationale for consideration by the journal. The cover letter should also list the authors and their affiliations, give the manuscript title, article type, and provide contact information for all authors. The cover letter should also provide a word count for the manuscript to show it is within the word limit, and the number of figure and tables.
**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.

**Line numbering text:**
Please ensure your paper has consecutive line numbering - this is an essential peer review requirement.

**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.

**Referees**
Authors should suggest the names of three international, independent potential reviewers (with full contact details. All manuscripts are sent to at least two independent reviewers to ensure both accuracy and relevance to the journal. The final decision on acceptance will be made by the Editor. Manuscripts may be sent back to authors for revision if necessary. Revised manuscript submissions should be made as soon as possible (within 6 weeks) after the receipt of the reviewer's reports. Peer review is essential to maintain the quality of the scientific literature. On acceptance of a manuscript for publication, it is expected that the authors will also serve as reviewers of future manuscripts in the same area of research as the manuscript submitted to the journal.

**Plagiarism Detection**
The peer-review process is at the heart of scientific publishing. As part of Elsevier's commitment to the protecting the integrity of the scholarly record, Elsevier has an obligation to assist the scientific community in all aspects of publishing ethics, including cases of (suspected) duplicate submission and plagiarism.

Cases of suspected plagiarism are rarely limited to the same journal or publisher. More often than not, multiple journals and publishers are involved. Software solutions, therefore, ideally require cooperation between (all) publishing houses. Elsevier uses CrossCheck, a service that allows publishers to verify the originality of published works, to detect potential plagiarism for all papers submitted to Elsevier journals including Resources, Conservation and Recycling. For more information please visit https://www.elsevier.com/editors/publishing-ethics/perk/plagiarism-complaints/plagiarism-detection.

**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.

**ARTICLE ELEMENTS**

**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.

**Highlights**

Highlights are optional yet highly encouraged for this journal, as they increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: example Highlights.

Highlights 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).

**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.

**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.

**Graphical Abstract or Highlights**

A Graphical Abstract or Highlights is mandatory for this journal. While the Graphical Abstract is strongly recommended, authors can choose to provide Highlights instead of Graphical Abstract (either Highlights or Graphical Abstract, not both).

**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. See https://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 and in accordance with all technical requirements: Illustration Service.

**Highlights** 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). See https://www.elsevier.com/authors/journal-authors/highlights for examples.

**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.

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.

Main article structure for Perspective
Perspective papers are integrated pieces without abstracts. Subdivisions are not required for perspective papers. If subdivisions are helpful for improving readability, authors are encouraged to minimize the number of subdivisions.

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.).

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 highly encouraged.
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. Using citation 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. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. More information on how to remove field codes from different reference management software.

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/resources-conservation-and-recycling
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 article number or 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 can be listed either first alphabetically, then chronologically, or vice versa.

Examples: ‘as demonstrated (Allan, 2000a, 2000b, 1999; Allan and Jones, 1999)… Or, as demonstrated (Jones, 1999; Allan, 2000)… 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 journal publication with an article number:
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.

References for Perspective papers
Up to five references are allowed for Perspective papers.

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.

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 600 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.
Submission checklist
The following list will be useful during the final checking of an article prior to sending it to the journal for review. Please consult this Guide for Authors for further details of any item.

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, and contain:
Keywords
All figure captions
All tables (including title, description, footnotes)
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)
Printed version of figures (if applicable) in color or black-and-white
Indicate clearly whether or not color or black-and-white in print is required.
For any further information please visit our customer support site at https://service.elsevier.com.

AFTER ACCEPTANCE

Online proof correction
To ensure a fast publication process of the article, we kindly ask authors to provide us with their proof corrections within two days. 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 Author Services. Corresponding authors who have published their article gold 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.

OTHER IMPORTANT INFORMATION
Ethics in publishing
Please see our information pages on Ethics in publishing and Ethical guidelines for journal publication.
**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, a published lecture or academic thesis, see 'Multiple, redundant or concurrent publication' 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.

**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 gold 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 gold 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.

**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.

The gold open access publication fee for this journal is **USD 3500**, excluding taxes. Learn more about Elsevier's pricing policy: [https://www.elsevier.com/openaccesspricing](https://www.elsevier.com/openaccesspricing).

This journal has an embargo period of 24 months.

**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](https://www.elsevier.com/author-services/editing) available from Elsevier's Author Services.
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.

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