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THE FOUNDATION OF MATHEMATICAL AND COMPUTATIONAL FORESTRY & NATURAL-RESOURCE SCIENCES (MCFNS)

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Abstract. The International Journal of *Mathematical and Computational Forestry & Natural-Resource Sciences* publishes biannual quantitative and analytical works in mathematical and computational forestry and natural resource sciences. The two areas of this scope cover the extreme ends of the currently (several decades old) predominant model of forestry and natural resource research. The center of this model consists of empirical data collection and associated statistical analysis. On one extreme of this model lies analytical derivation, such as equation derivation, mathematical proofs, and hypothetical theories. On the other extreme of the spectrum lie the modern computational sciences based on massive amounts of computations allowing solutions to formerly inconceivable problems. The journal also covers other works geared towards implementation of new computer related technologies or computational solutions. This journal applies a 3-stage peer review process that includes the traditional editorial consideration and double blind peer review by appointed referees, as well as a modern concept of Open Public Peer-Review system posting journal preprints online for worldwide scrutiny prior to their final publication. This journal promotes the modern features of e-publishing including but not limited to: Open Access, LaTeX support, advanced color graphs and animation publishing, e-attachments, active hyperlinks, custom intercept-links (URLs), flexibility in citation style, accompanying publication of original source manuscripts, manuscript public comments and discussion, and publication of outstanding Reviews as well as dispute and error corrections.

Keywords: Publishing, peer review, open access, journal, research, forestry, mathematical, computational, TeX, LaTeX

1 Introduction of Mathematical and Computational Forestry

The origins of forestry sciences are rooted in analytical thinking and mathematical derivations. Examples of the "Normal Forest" theory or various mathematical derivations related to the space and time order formulas used in forest management were natural-resource equivalencies of such theoretical constructs as the "Ideal Gas" or the "Free Falling Body" in physics and operational models in engineering. They were the manifestation of Rationalist attempts to construct basic structures for understanding complex operationally intractable problems. The emergence of commonly available computer technology superseded this type of research giving way to more expedient, empirically based computer analysis. For some reason it has become common for forestry and natural-resource scientists to feel that all concepts needing to be derived have already been derived and the only thing worth doing in forestry research are computer analysis of collected data and fitting of formerly derived models. This is an understandable evolutionary process in applied sciences research since the growing availability of computers makes traditionally difficult problems relatively easy and readily solvable by most practitioners. At the more advanced level of the evolutionary process lays the foundation of new computational sciences based on another type of analytical research that takes advantage of the immense power of computing technology by means of computer simulations of hypothetical models. Both these types of analytical research (mathematical derivations and advanced computer simulations) have been typically underrepresented in the current scientific literature of forestry and natural resource sciences. This journal was provided to remedy this underrepresentation and to serve the underrepresented domain.

2 The Last Thing the World Needs Is Another Forestry Journal

So we created one. We have created this journal to thrive on the edges, and in doing so we made sure that it was based on the most progressive principles we could devise.

- First, the publishing of this journal is a collective effort of scientists from different countries who have no commercial interests in this venture but merely want to serve their profession.
- Second, the focus and scope of this journal are currently not in the mainstream of any of the existing journals, but play an important role in contemporary forestry and natural-resource sciences and deserve to be represented and even helped in upholding and promoting the mathematical and computational aspects of these sciences.
- Third, the principles of operating this journal are set to uphold the highest standards in modern peer-review philosophy and publishing technologies.

Below we describe the principles and rules on which this journal is founded. The parts of this editorial are posted on the MCFNS.COM website under corresponding headings in different parts of the journal website.

3 The Focus and Scope of the Journal

"Mathematical and Computational Forestry & Natural-Resource Sciences" (MCFNS) is an international scientific journal dedicated to the promotion, publication, and public discussion, of high quality studies on the basic and computational research of forestry and natural resource sciences. The title of the journal is intended to be descriptive of this journal's main focus and scope. It is all-inclusive in the sense that it invites publications from a range of topics varying in scope from "Mathematical Forestry" to "Mathematical Natural-Resource Sciences," and from "Computational Forestry" to "Computational Natural-Resource Sciences." The notions of "Mathematical" and "Computational" sciences are intended to indicate a double focus on two opposite ends of the contemporary natural resource sciences spectrum. One end is the traditional Rationalist, derivation-based foundation of theoretical thinking that was the origin of all the sciences, but in recent decades, with the growing availability of inexpensive computers, is losing ground to the overriding usage of data-analysis-based studies. The other end of the spectrum is inevitably what many aspects of natural sciences must converge to in taking advantage of emerging and ever-growing and more readily available super-computing power. Inasmuch as the increasing computing resources demote the basic analytical research, replacing it with expedient empirical solutions, they promote a different kind of analytical research by opening new ways of structuring scientific pursuits, asking formerly unanswerable questions, and solving formerly insolvable problems with the use of computer-based modeling and simulations. Exploring the new research possibilities based on ever growing computing capabilities gives foundation to new computational sciences in Forestry and Natural Resources in the same manner in which the expanding computer capabilities helped to found such sciences as "Computational Genetics" and "Computational Physics." The predominant 21st-century model of scientific pursuit in Forestry and Natural Resource Scientific publishing is right in between the two extremes covered by this journal. The main modus of that model is to collect data and analyze them using statistical software. This journal provides a publishing platform for the Forestry and Natural Resource Sciences outside this model by virtue of the journal's focus on theoretical derivations and simulations, discussions, reviews and implementations of new computer-based technologies. Derivations are encouraged on all scientific bases, such as algebra, geometry, and plain logic. Similarly, computer simulations are within the scope of this journal's interests whether they are based on theoretical pseudo-data or massive collections of empirical survey data. In essence the "Mathematical and Computational" aspects of natural resource sciences are viewed by this journal as sharing the common platform of the Rationalist approach to research that is in contrast to the more mainstream Empiricist studies (statistical analysis of collected data) dominating the present natural resource sciences and predominantly covered by the other excellent forestry and natural resource sciences journals. By no means is the use of data in describing studies a detriment to publishing manuscripts in this journal, nor is use of data considered inferior in any way to the more theoretical approaches invited by this journal. Rather, the use of data alone is not a viable reason for publishing in this journal as it could be for publishing in the other forestry and natural resource science related journals. Also, absence of data is not a ground for rejecting a manuscript from publication in this journal as it could be for the other journals.

4 The Journal Sections, Types of Publications, and Public Comments

The journal tries to be flexible in the type of manuscripts it publishes and organizes them in different sections depending on the manuscript type, the type of its peer-review, submission and content. Listed below are the pertinent types of works that the MCFNS journal intends to publish.

Open-submission Peer-reviewed manuscripts
Monographs – defined as seminal works and extensive in-depth treatments of broad topics with exhaustive elaboration on the subject matter and its nuances.

Articles – defined as full-length articles, which includes Research Articles, Review Articles, and Discussion Articles.

Research Notes – defined as essentially short articles with substantial technical content.

Comments – defined as short communications such as: discussions of other articles, elaborated error reports on any publications in any outlet, refutations, technical disputes, commentaries, and rejoinders.

Errata – defined as brief corrections of factual errors, typos, or print errors, in existing articles by the editors or the article authors.

Editor's submission Peer-reviewed manuscripts
Editorials – defined as Articles, Notes, or Comments expressing the opinions of MCFNS editors on any given subject matter or events relating to MCFNS functions, policies or production, and their accounts of thereof.

Reviews – defined as referees' manuscript reviews that are considered by the editors to be either exemplary or otherwise complementary to the published manuscripts. They will be published as named or anonymous depending on the consent of their authors.

Open-submission Non-reviewed manuscripts
Non-refereed Reports – defined as general works covering subjects relevant to the journal mission.

Letters – defined as essentially Letters to Editor, which are considered relevant to the professional content of this journal and its mission and contents.

5 The Mission, Ambitions, and the Pledge of Accuracy

The mission of MCFNS is to publish peer-reviewed basic and applied research in Mathematical and Computational Forestry and Natural Resource sciences. This research can include theoretical solutions, proofs, derivations, software developments, and simulations, in forest management, growth and yield modeling, and other natural resource related studies. Journal items will be published collectively as part of an issue with its own Table of Contents biannually in February and August of each year. However, the journal preprints under Open Public Peer-Review will be posted on the journal preprint website as soon as they satisfy the first two stages of the journal peer review process.

The idea of the described below Open Public Peer-review would be impractical for paper-based journals and inconceivable without the Internet. The realization of this idea is possible because the journal is in electronic format and is Internet-based. We believe that this kind of review is a great idea and we take this concept even further. Unlike the paper-based publishing, the correction of errors in publications can be handled more effectively in electronic journals than it has been in paper-based journals. In addition to the traditional publication of Errata, which alert the readers about any newly discovered errors, the MCFNS implements the "Last Correction" date record in the header of the published manuscripts. Any typos, minor errors in type setting, or mere spelling mistakes discovered in the future by the authors or the readers will be corrected on the journal website copies of the publications with the recorded date of the "Last Correction". This way instead of circulating various copies of the same paper with different handmade corrections, the authors will be able to send the reader to the journal website with confidence that it will always contain the most up to date and correct copies of the publications.

In addition to the above, the editors of the MCFNS journal make a pledge to uphold the utmost accuracy of presented technical material in the journal publications regardless of the date or review or publication phase. Obviously it is impossible to never make an error; however, if any errors or misrepresentations of technical material are reported to, and substantiated by the MCFNS editors, they will make sure that the necessary corrections are made in an expedient and streamlined manner to revise or amend the erroneous content. In that sense, even though the MCFNS manuscripts are processed swiftly and made available to the public with no usual production delays, they can be considered to be permanently under the Open Public Peer-review process even after their publication.

The MCFNS has the ambition to be the preeminent authority journal in mathematical forestry worldwide, and it will not only unconditionally correct its own errors, but it will also publish corrections of any mathematical errors or inaccuracies in other forestry or natural resource journals that do not uphold the same policy or make the implementation of their policy in that regard in any way inconvenient, awkward, or inexpedient. The forestry and natural resource sciences deserve a place with refutability and corrections of errors readily available for anyone to access, and the MCFNS journal will be such a place.

The MCFNS policy on correction of inaccurate mathematical content is simple:

1. a reader reports an error to the editors and provides them with supporting evidence;

2. the editors acknowledge and express gratitude for it, and communicate the report to the authors of the publication containing the error; and

3. the authors (preferably) and/or the editors follow up with a verification and correction of the error in the form of Errata, Comment, or Discussion Article, and in the case of MCFNS publications and consent from the authors, with the correction of the actual article content updated at a new "Last Correction" date reported in the article's header.

Anything short of the above 1-2-3 process would, in the opinion of these editors, undermine the journal's accountability, to which this journal is unequivocally committed. Keeping this in mind, the readers may rest assured that any equation found in MCFNS may be safely cited, copied, used and quoted with regards to its origin with the utmost degree of accuracy and reliability. Correction of errors in other journals can be done simply by submitting a manuscript to the journal in a format of Errata (by the original author), Comment, or Discussion Article, which are all encouraged by this journal.

While the insistence on technical accuracy and refutability of this journal contents is non-negotiable, the journal editors will be extremely flexible with regard to various authors' styles and manners of expression. The editors will exercise maximum tolerance with respect to individual author preferences regarding manuscript and citation styles. The authors may choose between name-based and number-based citations depending on their preferences and the manuscript type (e.g., Research Article versus Review Article), and in addition they may use footnote-number-based citations with these styles to achieve an inconspicuous citation effect, similar to the "Nature" journal. Overall, the editors will only insist vigorously on grammatical correctness and compliance with rules dictated by external criteria of important journal rankings, such as the ISI indexing. However, if there is a conflict between the required rules and a style preferred by an author, and the author requests so, the editors will gladly publish the original unedited version of the manuscript along with the official compliant version of the edited manuscript as an appendix, or cited within the manuscript non-refereed report published at the non-refereed section of the journal.

6 The Peer-review Policies

The Section Policies outlined above list the journal sections in the order of the MCFNS peer review intensity. In general, the Monographs, Articles, and Research Notes require the highest level of review intensity and the largest number of Referees. The Comments, Errata, Editorials, and Reviews require less review with fewer referees and higher latitude with regard to review confidentiality, manuscript contents, and manner of expression. The Reports and Letters to Editors require only consideration by selected Editorial Board members and are not considered Peer-reviewed publications. A consideration by multiple Editorial Board members is the minimum MCFNS requirement for publishing any content on the journal website; nothing can be published on the MCFNS website without consent from at least two Editorial Board members.

The MCFNS peer-review process consists of up to three stages with varying intensity of review between the different sections of the journal.

The first stage of the MCFNS peer-review process is an initial consideration by at least two Editorial Board members. All publications of MCFNS are subject to this scrutiny. At this stage the editors decide if the topic of a candidate manuscript matches the Focus and Scope of the MCFNS journal and what, if any, changes need to be done to the content of the manuscript to fit the journal's domain. There are three potential outcomes for this stage: forwarding of the manuscript to the second stage of the MCFNS review process, redirecting the manuscript to another journal, or recommending changes in the manuscript content to make it compatible with the MCFNS Focus and Scope. This first review stage usually takes only a few days. The names of the selected Editorial Board members deciding on topic suitability are confidential, but the reasoning behind the decision is disclosed, and the authors are welcome to provide their rationale for any disagreements with the assessment.

The second stage of the MCFNS peer-review process is a double-blind peer review by two to four referees of whom at least one referee must be an expert on the manuscript's topic and at least one referee must be markedly fluent in English language style and grammar and be able to understand and follow the manuscript's topic. The editors may waive the double-blind aspect of the review for Comments, Editorials and Errata, while individual referees can choose to be identified by names in their reviews of any sections. The authors are encouraged to submit in their submission letter a list of qualified potential referees. The reviews by Referees usually take several weeks, but the journal also has an accelerated review process if needed. The main focus of the second stage of peer-review is scrutiny of technical content of the manuscript and making sure that the manuscript is clear in its communication, as well as identifying any other opportunities for improving the manuscript. The journal policy is to give maximum latitude to the authors' individual styles, but at the same time, the journal has a zero-tolerance policy for any refutable mathematical or otherwise factual errors. The reviewers at this stage are not asked to judge the manuscript topic suitability for the journal publication, but rather for identifying any manuscript shortcomings, inaccuracies, and factual errors that must be corrected before the manuscript can be published. If authors do not agree with potential deficiencies that might be claimed by reviewers, the reviewers will be encouraged to publish their critiques of the reviewed manuscript along with the manuscript itself. Occasionally, outstanding reviews that the editors deem complementary to the manuscript's content may be published, subject to the reviewer's consent, along with the manuscript, or alternatively the editors may anonymously quote them in the journal editorials.

The third, additional stage of the MCFNS peer-review process is an Open Public Peer-Review of the journal PREPRINTS. This stage is intended for Open-Access worldwide PREPRINT scrutiny enabling all potential readers to assume the Referee role for any MCFNS manuscript prior to its final publication on the official MCFNS journal website. The PREPRINT Open Public Peer-Review System is one of the distinguishing marks that sets the MCFNS journal apart from the conventional hard copy based journals, and puts it into the class of the most progressive contemporary journals, such as those of the Copernicus Publications, which originated the Public Peer-Review idea. The MCFNS journal treats the Public Peer-Review option as a complement to the traditional peer review described above, rather than as a replacement for it, so that the MCFNS publications can benefit from the combined strengths of both of these systems. The Open Public Peer-Review is available on the PRE.MCFNS.COM website until the manuscript is published in its designated issue. The publication issue may be subject to balancing of the manuscript backlog versus consistency of the journal production.

7 The MCFNS Preprint Open Public Peer-review

Some benefits of the traditional peer review system cannot be denied. Its double blind aspect removes any bias from assessment of the manuscript content (since the authors are anonymous) and any barriers in expressing critical opinions (since the reviewers are anonymous). Subsequently opening peer review to the public worldwide provides a greater chance of fresh manuscript ideas enriching the overall peer review process, and going beyond what just three reviewers can provide. Additional reviewers might also spot typesetting errors that could escape the earlier limited number of the appointed referees and editors. We believe that this additional peer-review process will increase the overall quality of the journal and its publications, as well as provide a common platform for early refutability and discussion of any potentially controversial issues in the manuscripts.

In this Public Peer-Review each PREPRINT has its own commenting space, hereafter called a Preprint Forum. Occasionally the editors may post the PREPRINTS with some comments in the relevant Preprint Forums from the double-blind peer review. Those would be the elements of the earlier reviews that the editors deemed still relevant to the current PREPRINTS. Both the reviewers and the authors can post or email comments and reply by posts or emails to comments in each of the Preprint Forums. However, in order for the comments to be considered as part of the Public Peer-Review, the review comments should be submitted to the Preprint Forums or emailed to the MCFNS Editors no later than one week prior to the publication date for each issue, which are in February (Issue 1) and August (Issue 2). If irreconcilable differences exist between the reviewers and the authors, the journal will provide an opportunity for the reviewers to publish their input as "Comments" in the same or following issues of the MCFNS journal.

Providing late comments on any matter requiring extensive changes to a manuscript may preclude the publication of it with the suggested changes or may preclude publication of the manuscript in the upcoming issue. For this reason the posted PREPRINTS contain the "Issue No. 0" and no date of publication, which will be updated at the time of publication. It should also be noted that, as mentioned earlier, publication of specific manuscripts in an issue might be subject to balancing of the manuscript backlogs versus consistency of the journal production.

Comments on each PREPRINT can be submitted as named or anonymous, but to submit the comments online the readers have to be logged in and registered with the MCFNS PREPRINT website. Online comments can be published at http://pre.mcfns.com using the "ADD COMMENT" link below the Abstract of the article, or using the "Add comment" link in the "Reading Tools" of the right hand side banner menu in the PDF view. The reviews posted on the website can be anonymous to the public but not to the Editors; the identity of the user posting the comment will be recorded by the system and accessible to the Editors if they need to communicate with that person. Creating "false identity" accounts in this system is prohibited. Confidential comments can also be emailed directly to the MCFNS Editors. The identities of all the commenting authors submitting or sending unnamed comments will be kept confidential unless the authors request otherwise. The

Editors will not entertain any anonymous emails, and they will consider only constructive criticisms and only substantiated claims.

The manuscripts posted on the preprints website can be cited as "MCFNS Preprints" with the appropriate listing of the website as http://pre.mcfns.com and the date it was accessed. Be aware that the Volume, Issue, and Page Numbers of PREPRINTS may change, and the manuscripts themselves may change before the final publication. So, always check the final published version of the manuscripts at the official MCFNS.COM website. Once published the manuscripts can be cited as the MCFNS publications according to the information published at the MCFNS.COM website.

8 Philosophy of Typesetting and Format of Submissions

Since the dawn of humanity, mankind has been attracted to WYSIWYG technology for shaping the look of published materials - until recently. Caveman drawings and carvings on cave walls were based on the WYSIWYG philosophy just as much as were the later monks' hand-written copying of books in monasteries, post-Gutenberg's lead-form font settings, and is the word processing we (the authors) do today. Over thousands of years nothing has changed in the core of this philosophy (i.e., keep changing manually the look in whatever medium you are working in, until you like what you see). We can consider ourselves extremely lucky that just recently, barely a few decades ago, contemporary scientists made a turning point in this inertia through the breakthrough invention of rule-based computer typesetting, such as TEX and LATEX. The rule-based computer typesetting is the first ever departure from the WYSIWYG philosophy since the beginning of publishing and it is a monumental contribution to typesetting philosophy. The general idea of the rule-based computer typesetting, such as TEX and LATEX, is remarkably simple, and it boils down to defining rules of typesetting, which arguably was always considered desirable – at least past the cavemen times, and having a computer to execute these rules without human intervention – a truly novel computational concept. The execution of these rules by the sophisticated mathematical and computational TEX and LATEX algorithms produces typesetting of unprecedented quality and consistency and is applied by all of the highest quality modern publishers, especially for works containing mathematical formulas.

The MCFNS journal strives for the highest possible publishing standards. It has a self-evident need to present many mathematical formulas with high quality and consistency. It is intended for an educated quantitative audience that is proficient in mathematics and computer technologies. Some of the MCFNS editorial board members are already experienced in using LATEX as typesetting tool, and some of the MCFNS authors are known to use LATEX for preparation of their manuscripts. There may not be any other option for the MCFNS journal than to use LATEX as its primary typesetting platform. Without it this journal could not honestly claim the highest standards of publishing and professionalism.

Yet, since many scientists still use word processors in their daily routine work (as we do) the journal will be accepting camera-ready submissions in MS Word, RTF, PDF, and Open Office formats. Note that in order to publish these manuscripts a substantial amount of work will need to be done to convert them from their original formats to LATEX. For this reason and for the reasons of accuracy of conversion and typesetting the authors must submit a programming code for all equations in the manuscript in one of the common computer languages, such as C, FORTRAN, SAS, SPSS, S+, Maple, TEX, LATEX, or even just Excel code with clearly defined names of all relevant cells. Providing the code may not be necessary for simple equations typeset using Mathtype in MS Word, since those may be translated with available conversion programs. Manuscript objects, such as tables, will need to be produced in MS Word using its Table Object tool, rather than using tabs and spaces, and objects such as figures will need to be submitted separately in EPS postscript format in addition to being embedded within the manuscript for review. In general the manuscripts are peer-reviewed in camera ready format with single spacing and tables and figures embedded in their final intended locations. Of course, the journal editors will be grateful to those who submit their manuscripts in LATEX format.

Disclaimer

The editors of the MCFNS journal have no intention to discredit or compete with other journals. Rather they intend to target a niche that addresses the mathematical and computational research needs in forestry and natural resource sciences in the areas outside of the mainstream interests of the other leading journals. The editors will make utmost efforts to make the journal function only as close to an ideal as practically possible.

Acknowledgements

The content of this editorial is based on many discussions with different members of the MCFNS Editorial Board, and especially with the members of the Founding Editorial Board. All the good ideas presented here came from those members or were originated during discussions with them, while all the shortcomings presented here were the authors doing alone.