

Rapport - Article scientifique

Marika Roberge^{a,1,4}, Bertrand Labrecque^{a,2,4}, and Juliette Boulet-Thomas^{a,3,4}

^aFaculté des sciences, Département de biologie, 2500 Boulevard de l'Université, Sherbrooke, Québec, Zip

This manuscript was compiled on April 18, 2025

Please provide an abstract of no more than 250 words in a single paragraph. Abstracts should explain to the general reader the major contributions of the article. References in the abstract must be cited in full within the abstract itself and cited in the text.

lépidoptères | communautés | variation temporelle | variation spatiale

A. Nos questions de recherche.

A.1. Question principale : Quels sont les changements dans la biodiversité des espèces de lépidoptères dans le temps et dans l'espace au Québec ?

Questions spécifiques (1 sur la variation temporelle et 2 sur la variation temporelle+spatiale) : ### **Variation temporelle** : Comment la diversité des espèces de lépidoptères a-t-elle évolué au fil des années?

Variation temporelle et spatiale : -Comment la répartition des espèces de lépidoptères varie dans le temps? carte avec différentes couleurs pour chaque bloc de 25 ans ou 50 ans avec différentes textures (4 cartes dans une avec heat map) -Comment la répartition de Vanessa cardui change dans le temps et l'espace?

À faire : 1. changer les noms de colonnes de la table de données brutes pour que ca soit plus compréhensible 2. ajouter des étapes dans la fonction nettoyage_data : pour enlever TXX:XX:XX de dwc_event_date et ajuster ca dans verification_data 3. S'assurer que obs_value réfère à quelque chose en particulier (presence, abondance, et ajuster les données de ca, ex. 11 111) 4. Dans la table secondaire date, voir à ce que chaque ligne soit unique (ex. site de 1 à 10 (donc de 10 lignes de combinaison de lat et lon unique) et dans table primaire à site_id on retrouverait chaque ligne avec 1 à 10) 5. Dans la table primaire on aurait les colonnes : nom_scientifique (observed_scientific_name), date (dwc_event_date), abondance (obs_value en filtrant seulement pour abondance dans obs_variable) et site_id et ? 6. Changer le nom de certains targets (ex. data_final et ULTIME_database)

Updates: 2. réglé dans la fonction type_colone, rete en caracteres 3. problème de 11111 réglé

À faire cette semaine (jusqu'à mardi soir 8 avril) : -Corriger l'étape 2 de 'À faire' -Revoir le 11 111, qu'est ce qu'on fait avec et qu'est-ce qu'on fait avec l'abondance dans nos analyses? -Clairer le site_id (faire le df pour le site_id) -Injecter les données -S'assurer que SQL et targets fonctionnent (et que le Markdown aussi) -Ajouter une ligne de retrait de base de données lepidoptero dans le script de SQL -Identifier clairement nos questions de recherches -Penser à ce qu'on veut présenter comme figures -Commencer à écrire le texte dans le Rapport -Il faudrait vraiment créer des sous-dossiers dans notre dossier de projet ProjetBIO_500 et mieux structurer tout ca, ca va aider à faire la dépendance du Rapport.Rmd dans le pipeline des targets! Pour ca, on devrait se baser sur le code par après que le prof nous a fourni pour compiler le RMarkdown dans targets. -Rajouter une colonne genre

This PNAS journal template is provided to help you write your work in the correct journal format. Instructions for use are provided below.

Note: please start your introduction without including the word "Introduction" as a section heading (except for math articles in the Physical Sciences section); this heading is implied in the first paragraphs.

Guide to using this template

Please note that whilst this template provides a preview of the typeset manuscript for submission, to help in this preparation, it will not necessarily be the final publication layout. For more detailed information please see the [PNAS Information for Authors](#).

Author Affiliations. Include department, institution, and complete address, with the ZIP/postal code, for each author. Use lower case letters to match authors with institutions, as shown in the example. Authors with an ORCID ID may supply this information at submission.

Submitting Manuscripts. All authors must submit their articles at [PNASentral](#). If you are using Overleaf to write your article, you can use the "Submit to PNAS" option in the top bar of the editor window.

Format. Many authors find it useful to organize their manuscripts with the following order of sections; Title, Author Affiliation, Keywords, Abstract, Significance Statement, Results, Discussion, Materials and methods, Acknowledgments, and References. Other orders and headings are permitted.

Manuscript Length. PNAS generally uses a two-column format averaging 67 characters, including spaces, per line. The maximum length of a Direct Submission research article is six pages and a PNAS PLUS research article is ten pages including all text, spaces, and the number of characters displaced

Significance Statement

Authors must submit a 120-word maximum statement about the significance of their research paper written at a level understandable to an undergraduate educated scientist outside their field of speciality. The primary goal of the Significance Statement is to explain the relevance of the work in broad context to a broad readership. The Significance Statement appears in the paper itself and is required for all research papers.

Please provide details of author contributions here.

Please declare any conflict of interest here.

⁴ M.R.(Author One), B.L. (Author Two) and J.B.-T. (Author Three) contributed equally to this work (remove if not applicable).

¹ To whom correspondence should be addressed. E-mail: marikaroberge@email.com



Fig. 1. Placeholder image of a frog with a long example caption to show justification setting.

by figures, tables, and equations. When submitting tables, figures, and/or equations in addition to text, keep the text for your manuscript under 39,000 characters (including spaces) for Direct Submissions and 72,000 characters (including spaces) for PNAS PLUS.

References. References should be cited in numerical order as they appear in text; this will be done automatically via bibtex, e.g. (1) and (2, 3). All references, including for the SI, should be included in the main manuscript file. References appearing in both sections should not be duplicated. SI references included in tables should be included with the main reference section.

Data Archival. PNAS must be able to archive the data essential to a published article. Where such archiving is not possible, deposition of data in public databases, such as GenBank, ArrayExpress, Protein Data Bank, Unidata, and others outlined in the Information for Authors, is acceptable.

Language-Editing Services. Prior to submission, authors who believe their manuscripts would benefit from professional editing are encouraged to use a language-editing service (see list at www.pnas.org/site/authors/language-editing.xhtml). PNAS does not take responsibility for or endorse these services, and their use has no bearing on acceptance of a manuscript for publication.

Digital Figures. Only TIFF, EPS, and high-resolution PDF for Mac or PC are allowed for figures that will appear in the main text, and images must be final size. Authors may submit U3D or PRC files for 3D images; these must be accompanied by 2D representations in TIFF, EPS, or high-resolution PDF format. Color images must be in RGB (red, green, blue) mode. Include the font files for any text.

Figures and Tables should be labelled and referenced in the standard way using the `\label{}` and `\ref{}` commands.

Figure

fig : frog

shows an example of how to insert a column-wide figure. To insert a figure wider than one column, please use the `\begin{figure*}...\end{figure*}` environment. Figures wider than one column should be sized to 11.4 cm or 17.8 cm wide.

Single column equations. Authors may use 1- or 2-column equations in their article, according to their preference.

To allow an equation to span both columns, options are to use the `\begin{figure*}...\end{figure*}` environment mentioned above for figures, or to use the `\begin{widetext}...\end{widetext}` environment as shown in equation

eqn : example

below.

Please note that this option may run into problems with floats and footnotes, as mentioned in the [cuted package documentation](#). In the case of problems with footnotes, it may be possible to correct the situation using commands `\footnotemark` and `\footnotetext`.

$$\begin{aligned}(x+y)^3 &= (x+y)(x+y)^2 \\ &= (x+y)(x^2 + 2xy + y^2) \\ &= x^3 + 3x^2y + 3xy^2 + y^3.\end{aligned}$$

Supporting Information (SI). The main text of the paper must stand on its own without the SI. Refer to SI in the manuscript at an appropriate point in the text. Number supporting figures and tables starting with S1, S2, etc. Authors are limited to no more than 10 SI files, not including movie files. Authors who place detailed materials and methods in SI must provide sufficient detail in the main text methods to enable a reader to follow the logic of the procedures and results and also must reference the online methods. If a paper is fundamentally a study of a new method or technique, then the methods must be described completely in the main text. Because PNAS edits SI and composes it into a single PDF, authors must provide the following file formats only.

SI Text. Supply Word, RTF, or LaTeX files (LaTeX files must be accompanied by a PDF with the same file name for visual reference).

SI Figures. Provide a brief legend for each supporting figure after the supporting text. Provide figure images in TIFF, EPS, high-resolution PDF, JPEG, or GIF format; figures may not be embedded in manuscript text. When saving TIFF files, use only LZW compression; do not use JPEG compression. Do not save figure numbers, legends, or author names as part of the image. Composite figures must be pre-assembled.

3D Figures. Supply a composable U3D or PRC file so that it may be edited and composed. Authors may submit a PDF file but please note it will be published in raw format and will not be edited or composed.

SI Tables. Supply Word, RTF, or LaTeX files (LaTeX files must be accompanied by a PDF with the same file name for visual reference); include only one table per file. Do not use tabs or spaces to separate columns in Word tables.

SI Datasets. Supply Excel (.xls), RTF, or PDF files. This file type will be published in raw format and will not be edited or composed.

SI Movies. Supply Audio Video Interleave (avi), Quicktime (mov), Windows Media (wmv), animated GIF (gif), or MPEG files and submit a brief legend for each movie in a Word or RTF file. All movies should be submitted at the desired reproduction size and length. Movies should be no more than 10 MB in size.

Still images. Authors must provide a still image from each video file. Supply TIFF, EPS, high-resolution PDF, JPEG, or GIF files.

Appendices. PNAS prefers that authors submit individual source files to ensure readability. If this is not possible, supply a single PDF file that contains all of the SI associated with the paper. This file type will be published in raw format and will not be edited or composed.

ACKNOWLEDGMENTS. Please include your acknowledgments here, set in a single paragraph. Please do not include any acknowledgments in the Supporting Information, or anywhere else in the manuscript.

1. Belkin M, Niyogi P (2002) Using manifold structure for partially labeled classification. *Advances in Neural Information Processing Systems*, pp 929–936.
2. Bérard P, Besson G, Gallot S (1994) Embedding riemannian manifolds by their heat kernel. *Geometric & Functional Analysis GAFA* 4(4):373–398.
3. Coifman RR, et al. (2005) Geometric diffusions as a tool for harmonic analysis and structure definition of data: Diffusion maps. *Proceedings of the National Academy of Sciences of the United States of America* 102(21):7426–7431.