

Peer Review Report

Review Report on Mapping Canada's green economic pathways for battery minerals: Balancing prospectivity modelling with conservation and biodiversity values

Original Research, Earth Sci. Syst. Soc.

Reviewer: Simon Willcock

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Article DOI: 10.3389/esss.2022.10064

EVALUATION

Q 1 Please summarize the main findings of the study.

This paper is quite interdisciplinary. Looking at overlap between new prospectivity model results for a major source of Canada's battery minerals with five ecosystem services and gaps in the protected-area network to identify areas of high geological potential with lower ecological risk.

16% of the most prospective model cells partially overlap with the current network of protected and other conserved areas. Moreover, the vast majority of the remaining high prospectivity cells correspond to ecoregions with less than half of the protected areas required to meet national conservation targets. Poorly protected ecoregions with high levels of one or more of the five ecosystem services are highlighted as having highest potential for conflicting land-use priorities in the future.

I was asked to focus on the ecosystem service aspects of the study (as this is my area of expertise).

Q 2 Please highlight the limitations and strengths.

The paper reads well. As a non-geologist, parts of it are a bit obscure to me – but that is a reflection of me and not the paper. Focussing on the ecosystem service section, I think it is strong. It uses published ecosystem service maps and covers a reasonable number of services.

I would be comfortable with these sections being published as is. The only way they could be improved is by updating from the old Millenium Ecosystem Assessment terminology (which is old, but not wrong) to that used now by IPBES (e.g. Natures Contributions to People, material services [not provisioning] etc). This would be a semantic change though and would not alter the findings at all (it also is not necessary – many believe the IPBES terms are not an improvement).

Q 3 Please comment on the methods, results and data interpretation. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.

Focussing on the ecosystem service and protected area results – they all look sound to me. I think their conclusions are interesting and supported.

Q 4 Check List

Is the English language of sufficient quality?

Yes.

Is the quality of the figures and tables satisfactory?

Yes.

Does the reference list cover the relevant literature adequately and in an unbiased manner?

Yes.

Are the statistical methods valid and correctly applied? (e.g. sample size, choice of test)

Yes.

If relevant, are the methods sufficiently documented to allow replication studies?

Yes.

Are the data underlying the study available in either the article, supplement, or deposited in a repository? (Sequence/expression data, protein/molecule characterizations, annotations, and taxonomy data are required to be deposited in public repositories prior to publication)

Yes.

Does the study adhere to ethical standards including ethics committee approval and consent procedure?

Yes.

If relevant, have standard biosecurity and institutional safety procedures been adhered to?

Not Applicable.

Q 5 Please provide your detailed review report to the editor and authors (including any comments on the Q4 Check List):

The paper reads well. As a non-geologist, parts of it are a bit obscure to me – but that is a reflection of me and not the paper. Focussing on the ecosystem service section (as requested by the editor – and this area being my expertise), I think it is strong. It uses published ecosystem service maps and covers a reasonable number of services.

I would be comfortable with these sections being published as is. The only way they could be improved is by updating from the old Millenium Ecosystem Assessment terminology (which is old, but not wrong) to that used now by IPBES (e.g. Natures Contributions to People, material services [not provisioning] etc). This would be a semantic change though and would not alter the findings at all (it also is not necessary – many believe the IPBES terms are not an improvement).

QUALITY ASSESSMENT

Q 6 Originality	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Q 7 Rigor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Q 8 Significance to the field	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Q 9 Interest to a general audience	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Q 10 Quality of the writing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Q 11 Overall quality of the study	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>