Paper # aerospace-3883653 v02

Article Title: "Optimization of land-based impact zones for spent rocket stages launched from the Baikonur Cosmodrome".

This manuscript addresses an important and timely problem with genuine methodological innovation. The development of an environmental decision support system for rocket stage impact zones represents a valuable contribution to sustainable space operations. The authors have responded conscientiously to reviewer feedback and made substantial improvements to the manuscript.

However, the work is not yet ready for publication without further revision. The methodological description needs additional detail to achieve reproducibility, the figures require enhancement for publication quality, the English requires professional editing, and the reference formatting must be brought into full compliance with journal requirements.

1. While you have added considerable detail to your methodology section, certain elements still lack the specificity needed for other researchers to fully replicate your work. For your Sentinel-2 analysis, you mention using imagery from the growing season between 2017 and 2023 with cloud cover below ten percent, but you have not provided the actual scene identifiers or specific acquisition dates.
I recommend creating a supplementary data table listing all Sentinel-2 scenes used, including their acquisition dates, scene identifiers, cloud cover percentages, and any quality flags that influenced your selection decisions.
Your description of atmospheric correction mentions that it was performed but does not specify which algorithm or software implementation you employed. Was it the Sen2Cor processor provided by the European Space Agency, or did you use a different atmospheric correction approach?
The soil assessment methodology references the bonitet classification system and Protodyakonov strength scale, which is appropriate for your study region. However, you have not provided the actual numerical coefficients or correction factors you applied. I understand these come from regulatory guidelines, but readers unfamiliar with Kazakhstani soil science standards would benefit from seeing the actual values in a table format. Consider adding a supplementary table showing the correction factors for humus content, salinity, structure, and erosion that you applied when calculating the soil quality index. Similarly, presenting the strength values you assigned to different soil texture classes would enhance transparency.

2. Your fire hazard assessment now has a dedicated subsection, which represents an improvement. However, the weighting scheme for classifying vegetation types by flammability remains somewhat implicit. I suggest creating an explicit classification table that shows which plant communities you identified in the study area, what flammability class you assigned to each, and what numerical weight each class received in your fire risk calculations. This would transform your methodology from descriptive to fully reproducible.
The composite stability formula you present in Equation 2 is conceptually explained, but the previous reviewer requested a sensitivity analysis showing how classification results change when weights are varied. This is a standard procedure in multi-criteria decision analysis and would substantially strengthen confidence in your results.

3. The economic damage assessment remains the weakest component of your methodology. You mention that restoration costs are calculated based on regulatory frameworks and that a separate manuscript on this topic is in preparation. While I understand the complexity of environmental economics, the current manuscript would benefit from at least one worked example showing exactly how you calculated restoration costs for a specific operational-territorial unit.

4. You acknowledge candidly that formal validation against actual landing locations cannot yet be provided, and you explain that your methodology was developed based on direct field experience within the Yu-24 impact area. This honest assessment of current limitations is appropriate and reflects

mature scientific thinking. However, I encourage you to be more explicit about your plans for future validation. What specific data would you need to collect to validate your stability classifications? How would you define successful validation? What metrics would you use to assess whether your recommended operational-territorial units actually demonstrate greater resilience to impacts than areas you classified as less stable? You might consider proposing a validation framework even if you cannot yet execute it.

5. Your figures convey essential spatial information, but several would benefit from technical improvements before publication. Many of your maps contain text labels that are difficult to read due to small font sizes. I recommend increasing label fonts to at least 10 points and ensuring sufficient contrast between text and background colors. Some figures would be improved by adding or enlarging north arrows and scale bars, which help readers orient themselves geographically.
The color schemes you have chosen for representing different classification categories are generally effective, but in a few cases the distinctions between adjacent categories are subtle. Consider whether your color ramps remain distinguishable when printed in grayscale, as some readers may print the article rather than viewing it on screen. You might also add pattern overlays in addition to colors to distinguish between categories, which improves accessibility for colorblind readers.
Your schematic diagrams of the Information and Analytical System architecture effectively communicate the data flow and integration logic. However, Figure 4 and Figure 5 contain considerable text in small fonts that becomes difficult to read when the figures are sized for publication. Consider simplifying these diagrams by reducing the amount of text within boxes and instead providing more detailed explanations in the figure captions or main text.

6. I recommend adding a table that presents the weighting coefficients used in your composite stability formula, showing the values assigned to vegetation condition, soil strength, soil quality, and relief factors. Include a column explaining the rationale for each weight. This would make your multi-criteria decision logic completely transparent.
Another useful addition would be a summary table showing the distribution of operational-territorial units across your stability classifications. Present the number and total area of units classified as high stability, moderate stability, low stability, and unstable, along with the percentage of the total impact zone each category represents. This quantitative summary would complement your spatial maps and give readers a quick overview of how environmental stability is distributed across the study area.

7. You appropriately acknowledge that your satellite imagery represents conditions averaged over 2017 to 2023, and you note that ecosystem conditions change over time. However, you could strengthen this discussion by being more specific about how your Information and Analytical System would handle temporal updates. How frequently should the environmental baseline be recalculated? Would you recommend annual updates, or would longer intervals suffice given the arid steppe environment's relatively slow vegetation dynamics?

8. Your reference list requires complete restructuring to meet MDPI Aerospace standards. I have identified numerous formatting inconsistencies that must be corrected. Some references lack complete bibliographic information such as volume numbers, page ranges, or DOI identifiers.

9. The scientific content of your manuscript is strong, but the English language presentation requires professional editing before publication. Throughout the text I encountered grammatical inconsistencies that create unnecessary friction for readers. Article usage is often incorrect, with definite and indefinite articles missing where needed or inserted inappropriately. Subject-verb agreement errors appear sporadically, particularly in longer sentences with complex clause structures. Preposition choices sometimes deviate from standard scientific English usage.
Your sentence construction tends toward unnecessary complexity, with multiple embedded clauses that force readers to work harder than necessary to extract your meaning. Scientific writing benefits from directness and clarity. I recommend breaking many of your longer sentences into shorter, more focused statements. This will substantially improve readability without losing any scientific content. Word

choice represents another area needing attention. You sometimes select terms that are close to but not quite the standard terminology used in international environmental science literature. Certain concepts seem translated too literally from Russian rather than using the conventional English expressions that readers expect.