Review of: "Gumbel's Extreme Value Distribution for Flood Frequency Analyses of Timis River"

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Potential competing interests: No potential competing interests to declare.

Overall, the paper titled "Frequency Analysis of Floods Using Gumbel Distribution: A Case Study of Timis River" addresses an important issue in water resource engineering, namely the estimation of peak flood flows. The study focuses on employing flood frequency analysis, specifically utilizing the Gumbel distribution method, to assess the frequency of floods in the Timis River over a 30-year period from 1993 to 2022. The paper sets out to analyze the maximum annual flows and determine the return periods (T) of 5 years, 10 years, 50 years, 100 years, and 150 years.

Strengths:

1. Relevance and Importance: The topic addressed in the paper is highly relevant to water resource engineering, particularly in understanding and predicting flood events, which is crucial for effective water management and infrastructure design.
2. Methodological Clarity: The paper clearly outlines the methodology employed, focusing on the Gumbel distribution method for flood frequency analysis. This transparency is essential for replicability and credibility of the study.
3. Case Study Approach: The choice of the Timis River as a case study provides practical insights into the application of the Gumbel distribution method in a real-world scenario, enhancing the relevance of the research findings.

Areas for Improvement:

1. Data Quality and Sources: It would be beneficial to provide more details regarding the data sources and quality assurance procedures undertaken to ensure the reliability of the maximum annual flow data used in the analysis. Additionally, discussing any potential limitations or uncertainties associated with the data would enhance the robustness of the study.
2. Statistical Analysis: While the paper mentions the use of the Gumbel distribution method, it would be beneficial to include more details on the statistical techniques employed, such as parameter estimation and goodness-of-fit tests, to validate the suitability of the chosen distribution for modeling flood frequencies.
3. Discussion of Results: The paper should include a thorough discussion of the results obtained from the analysis, including interpretations of the return periods for different flood magnitudes and their implications for water resource management and engineering design. Providing insights into the practical significance of the findings would enhance the impact of the study.

Overall, the paper presents a valuable contribution to the field of water resource engineering by applying the Gumbel distribution method to analyze flood frequencies in the Timis River. By addressing the suggested areas for improvement, the authors can further enhance the rigor and relevance of their research.