Dear Dr Danlele Giordan, Editor

After reading authors' "nhess-2021-180-author_response-version1" and "nhess-2021-180-ATC1" (a marked copy of the revised MS), I want to submit my final report and recommendation (see **C2** below) to assist you on reaching a final decision.

Kindest regards
Referee 1 (October 14, 2021)

Final Report from Referee 1 on NHESS-2021-180-manuscript-version3

A. General Comments

A1). This referee has perused "nhess-21-180-author_response-version1" and "nhess-2021-180-ATC1" (a marked copy of the revised MS) resubmitted by the authors. The former gives the details of author's response to the comments raised by both referees, while the latter is a marked copy with highlight within the MS showing revisions are made (in yellow shading and/or in red color), including those revised independently by the authors (in red color).

A2). This referee understands that authors have detailed their process of revision in the "nhess-21-180-author_response-version1" file (PDF), stating an interim revision was first made based on the comments from referee 1.

This referee is satisfied with authors' response, after reading their "nhess-2021-180-RC1-AC1-supplement" compare with the marked copy uploaded to the system.

Authors then further revised the manuscript, using the interim MS, after receiving the comments from Referee 2. The final MS, now called "nhess-2021-180-manuscript-version3", is resubmitted for discussion and for the editor to make final decision.

A3). After comparing the original MS (i.e., version 1) with the marked copy (i.e., nhess-2021-180-ATC1) and the final MS (i.e., version 3), this referee believes that the quality of the manuscript has greatly improved, not only in the readability in English, but also in overall organization, which includes the revision in title, Abstract, sections and sub-sections (indicated in **A5** below), and the content itself (shown in "nhess-2021-180-ATC1").

A4). To be more specific, authors have revised the title, several section and sub-section headings from the original version reproduced below:

Original title: "Quantitative interpretation of risk potential of beach erosion due to coastal zone development"

1. Introduction
2. Beach Erosion Risk
   2.1 Definition of beach erosion risk
   2.2 Risk potential of beach erosion
   2.3 Calculation process of the beach erosion risk
3. Quantitative Interpretation

3.1 Sediment budget reduction potential
3.2 Longshore sediment deposition potential
3.3 Cross-shore sediment retreat potential

4. Case Study for Bongpo-Cheonjin Beach
   4.1 Study site description
   4.2 Sediment budget reduction in the study site
   4.3 Longshore sediment deposition potential caused by the construction of harbor breakwater
   4.4 Cross-shore beach retreat due to the high wave incidence
   4.5 Erosion risk potential at Bongpo-Cheonjin Beach
4. Discussion
5. Concluding Remarks

to

A5) Revised title: "Assessment of potential beach erosion risk and impact of coastal zone development: a case study on Bongpo-Cheonjin Beach"

1. Introduction
2. Beach Erosion Risk
   2.1 Definition of beach erosion risk
   2.2 Potential beach erosion risk
   2.3 Combined potential erosion risk curve
3. Assessment of Erosion Risk for Contributing Components
   3.1 Sediment reduction from updrift river
   3.2 Shoreline reshaping due to harbor construction
   3.3 Shoreline retreat due to episodic storm
4. Case Study at Bongpo-Cheonjin Beach
   4.1 Site description
   4.2 PBEA due to development in watershed
   4.3 PREA cause by the construction of harbor breakwater
   4.4 PEEA due to shoreline retreat during storm
   4.5 Combined potential erosion risk at Bongpo-Cheonjin Beach
5. Discussions
5. Concluding Remarks

B. Specific Comments

B1). New acronyms (e.g., PBEA, PREA and PEEA) are introduced unexpectedly in the revised sub-sections 4.2 – 4.4, shown in **A5** above. These technical terms should be pre-defined in Section 3. Please consider to re-revise some section and sub-section headings (shown in **deep blue** below), based on the authors' revised section and sub-section headings listed below.

1. Introduction
2. Beach Erosion Risk
   2.1 Definition of beach erosion risk
   2.2 Potential beach erosion risk
   2.3 Combined potential erosion risk (CPER)
3. Assessment of Potential Erosion Area (PEA)
   3.1 Background erosion from watershed and river (PBEA)
   3.2 Reshaping of shoreline due to harbor breakwater (PREA)

3.3 Episodic storm caused beach erosion (PEEA)

4. Case Study at Bongpo-Cheonjin Beach
   - 4.1 Site description
   - 4.2 PBEA due to development in watershed
   - 4.3 PREA due to construction of harbor breakwater
   - 4.4 PEEA due to episodic storm
   - 4.5 CPER curve for Bongpo-Cheonjin Beach
5. Discussions
6. Concluding Remarks

B2). Minor correction required, with line number marked.

[L 25] Add a 'dot' after the '1' in "1 Introduction" → "1. Introduction"

[L 437] Change section number, from "5. Concluding Remarks" → "6. Concluding Remarks"

C. Recommendation

C1). One of the main contributions from the authors is the concept of a "Combined Potential Erosion Risk (CPER)" curve, which can be applied to assess the potential erosion area (PEA) and beach width as a function of the return period (frequency) of a storm to a target beach. This CPER curve is produced from three risk components that include (1) Background erosion from watershed/river at updrift – PBEA, (2) Reshaping of shoreline due to construction of harbor breakwater – PREA, and (3) Episodic storm impact on beach erosion – PEEA. (Sections 3 – 4 in **B1**).

This method will benefit many coastal managers in the world on assessing the potential beach erosion risk to their own beaches, especially on crenulated beaches.

C2). Based on the evidence of the revised title, reorganization of the sections and sub-sections (now more systematic and explicit than the original MS), and greater improvement in quality of the content (shown in "nhess-2021-180-ATC1" – marked copy and "nhess-2021-180-manuscript-version3" – clean copy), this referee wishes to recommend that the paper be accepted for publication in the NHESS, subject to the trivial correction of the section and sub-section headings mentioned in **B1** above.

***** END of FINAL REPORT ****