

Indonesia Disaster Knowledge Update - September 2024

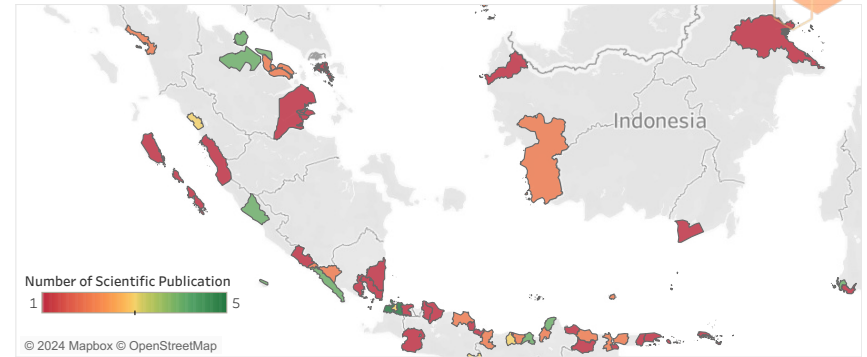
Extreme Weather Disasters in the Marine and Coastal Areas of Indonesia

The extreme weather phenomenon in the coastal regions of Indonesia is in dire need of attention due to its significant impact on the environmental, societal, and economic aspects therein. As sea levels rise and tidal floods destroy the mangrove and coral ecosystems, many species lose their habitats. In a social aspect, the increasing disaster risk has forced coastal community members to evacuate and lose their source of income. The fisheries and tourism sectors are also negatively impacted, whereas the lives of many families depend on this business. Given the circumstances, the challenge to build resilient coastal communities has grown urgent.

Overcoming the extreme weather issue in the coastal areas of Indonesia requires an integrated multidisciplinary knowledge-based approach. Such attention is vital in decreasing the disaster risk and building the local communities' resilience. Weather pattern observations and research, ecosystem restoration, disaster-resilient infrastructure building, and increasing people's awareness of the climate crisis are essential to address the extreme weather issue. It is also important to take strategic steps such as improving mass education, implementing sustainable resource management, fostering multisectoral collaborations, and creating policies to address the climate crisis.

In this Indonesia Disaster Knowledge Update (IDKU) issue, our team analyzed the compelling findings from various scientific publications on extreme weather in Indonesia. We discovered that most scientific publications on extreme weather are still dominated by theoretical and general studies, with few publications conducting specific analyses of particular extreme weather events.

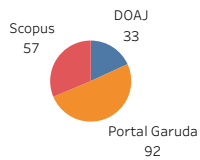
Distribution Map of Extreme Weather Scientific Publications



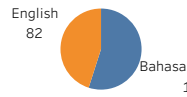
Statistical Data on Extreme Weather Publications and Occurrences in Indonesia within the Research Context

139 Publishers **182 Publications** **3,106 Disaster Events**

Publications by repository/index

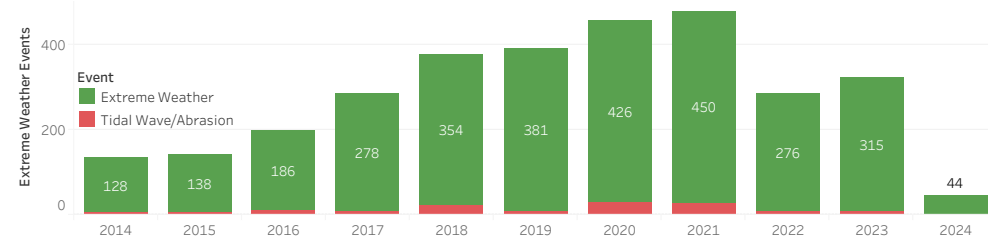


Publication by Language



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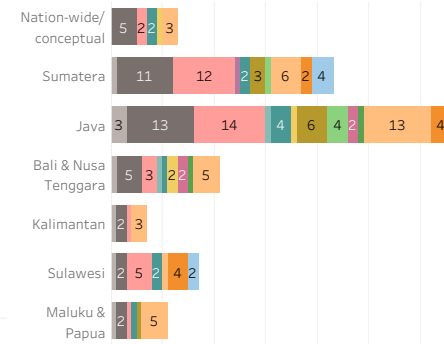
- The keywords used in the publication collection are "extreme weather", "sea", "coastal", "Indonesia";
- The disaster incident data used in this analysis is disaster event data from DIBI BNPB from 2014-2024.



Our team compiled articles from CARII's Knowledge Engine focusing on extreme weather in coastal and marine areas of Indonesia, published between 2019 and 2023 and sourced from Scopus, DOAJ, and Portal Garuda repositories. The articles include journals and proceedings written in both English and Indonesian. Through investigating, we have filtered 182 publications from 139 different publishers for review in this issue. Additionally, we have included information on 3,106 occurrences of extreme weather in coastal and marine cities or regencies in Indonesia, sourced from the National Disaster Management Authority of Indonesia's database, DIBI.

Java Island as the Majority of Research Areas

Number of publications by region and disaster threat



- Specific Hazard
- Storm Tides
 - Storm Surge
 - Rogue Wave
 - Marine
 - Landslide
 - Flood
 - Extreme Weather
 - Estuarine Flood
 - Erosion
 - Depression Or Cy...
 - Depression
 - Coastal Flood
 - Coastal Ero..
 - Abrasion

The following graph shows that most extreme weather research focuses on areas experiencing frequent tidal floods or erosion, particularly on Java Island. Among the provinces in Indonesia, Central Java has the highest number of extreme weather publications, with 72 out of 182. This figure corresponds to the frequent occurrence of extreme weather events along the area's northern coast, such as coastal erosion, abrasion, and tidal floods.

A Study on Extreme Weather in the Northern Coast of Java



A word cloud analysis reveals that research on extreme weather-related disasters in Indonesia is predominantly concentrated in coastal districts and cities. This pattern is particularly evident in the northern coastal regions of Java, including Central, West, and East Java. The most frequently studied areas include Pekalongan, Rembang, Cirebon, Karawang, Bangkalan, Probolinggo, and Tuban. Additionally, Padang City in West Sumatra and Tanah Laut Regency in South Kalimantan also emerge as significant research foci.

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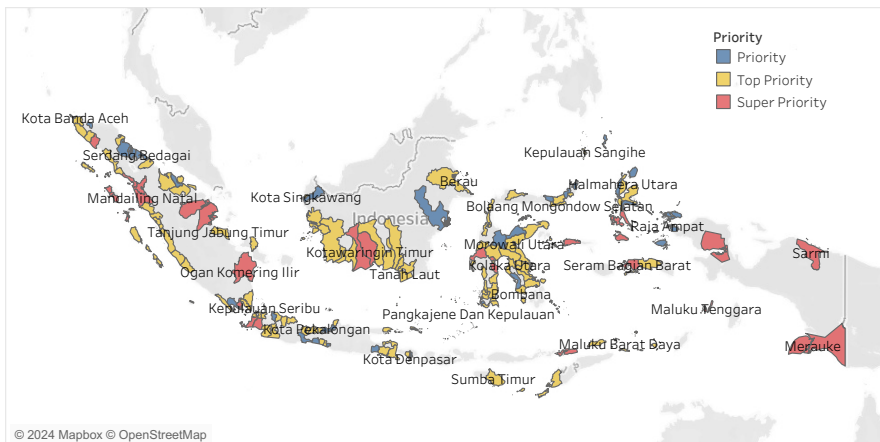
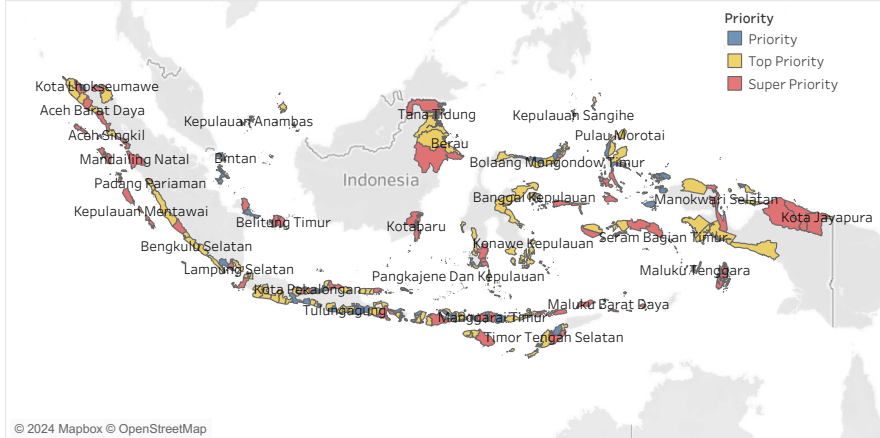
Authors: Dewa Putu A.M., Olga Ayu Dewantari, Firliani Fauziah, Herve Pierre Sidarta, Naffisa Adyan Fekranie | Reviewers: Ridwan, Ridwan F. | Editor: Retno Rifa Atsari

Data Sources: CARII Repository-of-Repositories (DOAJ, Scopus, & Garuda), and BNPB

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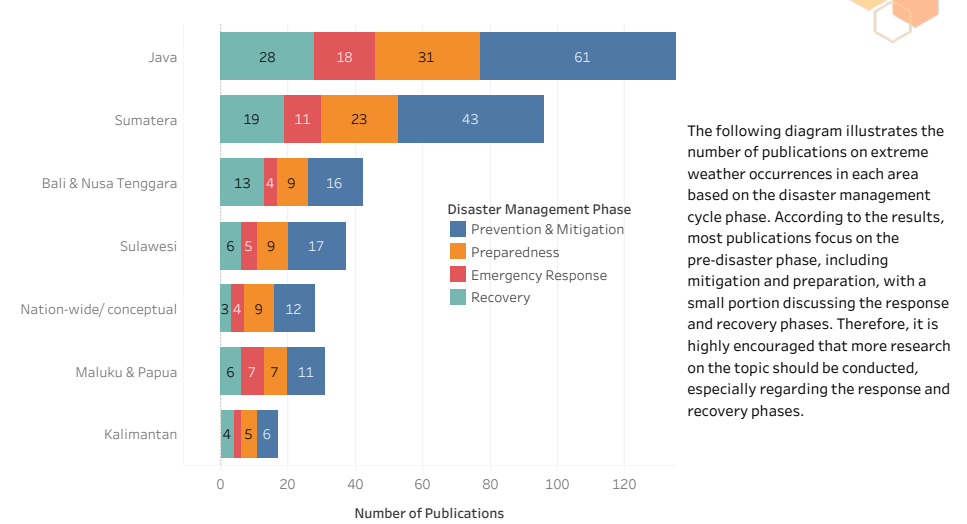
Prioritization of Climate Change Adaptation in Marine and Coastal Areas



The National Development Planning Agency (BAPPENAS) identified priority locations and climate resilience actions in 2021. These recommendations serve as guidelines for central and local governments, as well as non-governmental organizations, in developing climate resilience plans. Analyzing Book 1: List of Locations and Climate Resilience Actions in 2021, we observed a higher concentration of priority locations for climate resilience in marine areas compared to coastal areas. Sumatra and Java have a greater number of such priority locations, while Sumatra, Alor, and Merauke are particularly prioritized for marine resilience.

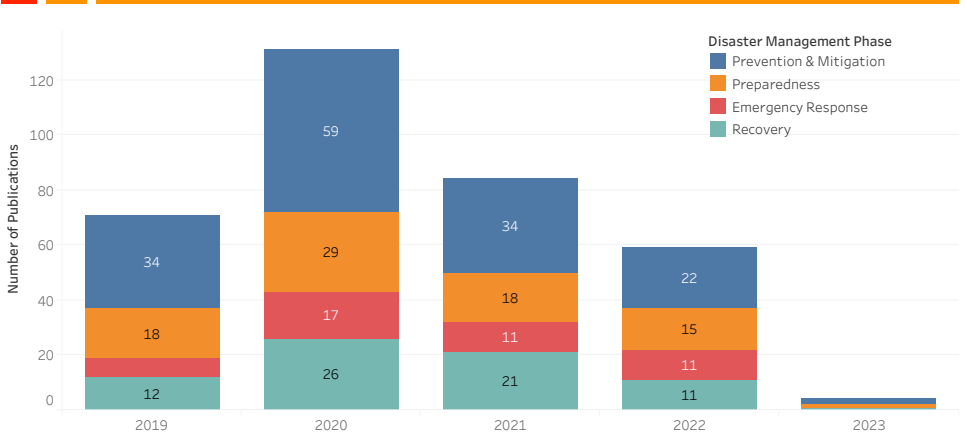
When comparing these priority locations with the distribution of scientific publications on extreme weather in Indonesia, we find a strong correlation. However, a notable gap exists in the eastern part of Indonesia regarding research supporting climate resilience, particularly in relation to extreme weather. To address this, initiating more research in eastern Indonesia is crucial to enhance our understanding of climate resilience and effectively implement related actions.

Publication on Extreme Weather based on Disaster Management Phase in Each Region in Indonesia



The following diagram illustrates the number of publications on extreme weather occurrences in each area based on the disaster management cycle phase. According to the results, most publications focus on the pre-disaster phase, including mitigation and preparation, with a small portion discussing the response and recovery phases. Therefore, it is highly encouraged that more research on the topic should be conducted, especially regarding the response and recovery phases.

Publications on Extreme Weather Based on Disaster Management Phases Each Year



Research on extreme weather in coastal districts and cities has seen a significant increase since 2020. While most studies focus on disaster prevention and mitigation, a decline in research on this topic has been observed since 2020. Given the growing frequency of extreme weather events, increased attention to this area of research is essential.

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Publication Sankey Diagram: Research Location to Disaster Management Phase to Hazard Type



Tableau can't export Viz Extensions.

Depression
Extream Weather

The Sankey diagram provides a proportional visualization of the publication distribution. The square size and the line thickness display the number of publications. The larger the square and the thicker the line, the greater the sum of publications. The diagram above, in particular, illustrates the distribution of each research, along with their correlation to the location of study, hazard phase, and extreme weather hazard class type. According to the result, the majority of publications focus on Java. The most frequently discussed disaster phase in the publications is preparedness and mitigation. Meanwhile, the most commonly addressed hazard type in the publications is marine-related.

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