TRANSNAV
http://www.transnav.eu
the International Journal on Marine Navigation and Safety of Sea Transportation
Volume 19
Number 3
September 2025
DOI: 10.12716/1001.19.03.31

Tourist Safety on the Polish Baltic Coast: Analysis of Risks and Preventive Strategies

M. Bogalecka & A. Grobelna
Gdynia Maritime University, Gdynia, Poland

ABSTRACT: The Polish Baltic Sea coast is a popular destination for tourists seeking picturesque landscapes, sandy beaches, and a rich cultural heritage. Each year, millions of visitors flock to the region to enjoy its natural beauty and recreational opportunities. However, the increasing number of tourists also brings unique challenges related to safety and risk management. Ensuring the safety of visitors is a multifaceted task that requires collaboration between local authorities, businesses, and emergency services. The paper explores the primary risks faced by tourists on the Polish Baltic coast, including natural hazards, infrastructure challenges, and human-related factors such as crime or accidents. Furthermore, it examines the strategies and measures implemented to mitigate these risks, highlighting the importance of education, preparedness, and effective communication. By analyzing both threats and preventive actions, this study aims to provide valuable insights for policymakers, local stakeholders, and tourists themselves to enhance safety and promote a secure environment for all.

1 INTRODUCTION

The Polish Baltic Sea coast is a key destination for domestic and international tourism, being among the most attractive regions in Poland [1] offering diverse natural, historical and cultural attractions. It is characterized by extraordinary natural diversity and a specific climate, which determines the recreational and health values of this region [1].

Spanning the southern Baltic Sea coast, it features sandy beaches, cliffs like those of Wolin National Park, and the shifting dunes of Słowiński National Park. Rich biodiversity and protected areas attract eco-tourists, while cities like Gdańsk, Sopot, and Kołobrzeg offer cultural and historical sites [2, 3]. Accessibility through highways, railways, and airports, along with ports and marinas, enhances its appeal for tourism, particularly maritime tourism [4].

The coast caters to diverse interests, from family-friendly resorts and luxurious spas to adventure tourism activities like kite surfing and diving. Health tourism thrives in spa towns such as Kołobrzeg and Świnoujście, known for therapeutic mud and brine waters. Although summer remains the peak season, off-season offerings such as cultural festivals and wellness retreats are growing, making it a year-round destination. For years tourism supports local economies, creates jobs, and fosters regional development, drawing visitors from neighbouring countries such as Germany and Scandinavia, thanks to its proximity and competitive pricing [5, 6].

The seasonal nature of tourism along the Baltic Sea [7] significantly influences the safety considerations of both visitors and local communities. The Polish Baltic Sea coast, like many coastal destinations, experiences a large influx of tourists during the summer months, driven by favourable weather, school holidays, and the

appeal of beach activities. This seasonality creates unique challenges and opportunities for managing safety.

The primary goal of this paper is to identify the unique challenges associated with ensuring tourist safety along the Polish Baltic Sea coast and to evaluate the effectiveness of current management strategies in addressing these issues. The dynamic and seasonal nature of tourism in the region introduces various safety concerns, from overcrowded beaches during peak summer months to the off-season time. By analysing these challenges, the article seeks to highlight specific risk factors, such as water-related accidents, weather unpredictability, and infrastructure limitations. Furthermore, it aims to assess the adequacy of existing safety protocols, emergency response mechanisms, and public awareness initiatives to mitigate these risks. A critical evaluation of these strategies will help identify gaps and propose actionable improvements to enhance overall safety for tourists. Ultimately, the article aspires to contribute to the development of a comprehensive and adaptive safety framework that can address both seasonal and year-round needs in this key tourist destination.

2 LITERATURE REVIEW

In the literature, the issue of tourist safety in the context of the Baltic Sea remains relatively underexplored. A search of the Web of Science (WoS) database conducted at the end of December 2024 gave only 7 articles that met the search criteria "tourism AND baltic AND safety". The oldest one is from 2011, while the most recent was published in 2022. A slightly better result was obtained when the database was searched for threats to tourists in the Baltic Sea region. Using the filter "tourism AND baltic AND (threat OR hazard)", 20 publications were found. The oldest of these was published in 1991, and the most recent in 2023 (Fig. 1).

Figure 1. The number of articles indexed in the Web of Science database searched according to various criteria (source: own work based on the WoS database).

These data clearly indicate that the issue of threats and safety for tourists in the Baltic Sea region is not a frequent topic of scientific research. This may stem from researchers' insufficient recognition of its significance or from the perception that these threats are relatively minor in the public eye. This gap in the scientific literature required using a more general search filter, namely "tourism AND baltic". As a result, we compiled a dataset of 392 publications. The oldest comes from 1984, while the most recent is from 2024, with the highest number of articles published in 2023 (Fig. 1).

The analysis of this dataset was also performed using the VOSviewer application, which visualises bibliometric data networks as maps containing nodes (concepts) and their interconnections (edges) derived from the authors of scientific works. Based on the first map (Fig. 2), it is evident that the "Baltic Sea" and "tourism" are the most significant nodes in the network, indicating they are the most frequently co-occurring concepts in the analysed publications. These terms are connected to numerous other concepts, highlighting the interdisciplinary nature of research in this area. The topics include fields such as environmental protection, infrastructure development, regional management, and climate change, demonstrating that the region is treated as an example of a place where tourism must be sustainable to protect fragile marine ecosystems. The map reveals several main thematic clusters.

Figure 2. Visualisation of the network of the links between the keywords “tourism” and „baltic” and others (source: own work based on the WoS database and the VOSviewer).

The red cluster focusses on regional cooperation in the Baltic Sea area, encompassing "EU funds" and the "blue economy". This highlights aspects of tourism management and regional development. Additionally, "cooperation" and "regionalization" have strong ties to the "blue economy”, underscoring the importance of regional collaboration in achieving sustainable tourism development. The red cluster also connects with the orange one, which includes “health tourism”, pointing to the growth of medical and health tourism in the Baltic Sea region. The yellow cluster centres on tourism “destination”, the impact of the “COVID-19” pandemic and the “region”. This suggests a focus on tourism's sensitivity to COVID-19-related disasters in the Baltic region. The green cluster refers to “climate change”, with particular emphasis on the issue of cyanobacterial “blooms”, which hinder water sports activities [8]. This indicates a growing interest in the impact of environmental changes on tourism in the region. The blue cluster covers topics related to the tourism infrastructure, such as "ports", "cruise ships", and environmental issues such as "waste management". The purple cluster addresses pollution issues, including “plastic pollution” in connection with “marine debris” and “waste management”, highlighting the increasing attention of researchers to marine pollution and environmental protection in the region.

Another map (Fig. 3), also generated in VOSviewer, presents a network of concepts with an additional temporal dimension, indicating the evolution of research interests between 2016 and 2024. The colour of the nodes reflects the period when these concepts were studied more intensively, ranging from blue (earlier years) to yellow (more recent years).

Figure 3. Overlay visualisation of the links between the keywords "tourism" and "baltic", and others in years 2016–2024 (source: own work based on the WoS database and the VOSviewer).

The blue nodes represent the period before 2018, during which topics related to "health tourism" were extensively researched, as well as issues related to tourism infrastructure, such as "cruise ships" and "ferry lines". The green nodes, covering the years 2018–2022, demonstrate a shift in focus towards "ecosystem-based management", international "cooperation", the "blue economy", as well as topics like "waste management", "marine debris", and "plastic pollution". This suggests that during this period, researchers concentrated on environmental issues and pollution in the Baltic Sea region.

The most recent research, marked by yellow nodes from 2023 onwards, continues to address the issues of microplastics and "climate change", "decision-making", and the impact of these changes on ecosystems and tourism. Looking at this map, one can observe the changing priorities and the dynamic nature of tourism research in the Baltic Sea region: topics such as "health tourism" and "marine debris" were more popular in earlier years, but their importance has diminished compared to emerging issues such as "climate change" and "decision-making", highlighting the appearance of new research trends. The dynamic nature of research topics also reveals how rapidly emerging global challenges, such as environmental degradation and decision-making frameworks, are reshaping the academic discourse on tourism. Understanding these evolving trends can help policymakers and researchers better align their strategies with the changing needs of regional tourism development and environmental management.

3 ASSESSING RISKS AND IMPLEMENTING SOLUTIONS FOR TOURIST SAFETY ON THE POLISH BALTIC SEA COAST

The Polish Baltic coastline measures approximately 770 kilometres in length, encompassing and offering tourists a variety of regions distinguished by different types of coastal, such as sandy beaches, dunes, and cliffs [9]. According to the Eurostat methodology, coastal areas are classified on the basis of the distance of a given commune from the sea: if a commune borders with the sea, it is, as a rule, a coastal commune; if a commune does not border with the sea but 50% of its area is within 10 km from the sea, it is also considered a coastal commune. This way 55 communes of the voivodships: Pomorskie (26), Zachodniopomorskie (23) and Warmińsko-Mazurskie (6) are classified as coastal areas in Poland. They cover 2.9% of Poland's territory (9.1 thousand square kilometres) and are inhabited by 4.2% of the country's population (1.6 million people) [10]. Among the most popular resorts in this region are Świnoujście, Międzyzdroje, Rewal, Kołobrzeg, Ustronie Morskie, Mielno, Łeba, Władysławowo and the Tri-City (Gdańsk, Sopot and Gdynia).These destinations offer a diverse range of attractions: from touring historic lighthouses and promenading along Europe's longest wooden pier in Sopot or the Avenue of Stars – with handprints of Poland's film and theatre luminaries – in Międzyzdroje, to visiting the Fisheries Museum in Świnoujście or exploring the World War II bunkers in the vicinity of Ustka (Fig 4). Additionally, it is worth highlighting the Sopot, which at the beginning of the 20th century, gained recognition as one of the most attractive and frequently visited European health resorts, widely known as the summer capital of Poland [1]. This widespread acclaim is due to its unique location, the natural and cultural environment, as well as the ongoing efforts to preserve its spa and health traditions through various treatments and activities. With a population of around 40,000, Sopot remains one of the most renowned resorts in the Baltic [1]. In summary, Sopot and all the aforementioned coastal localities offer distinctive attractions that continue to draw tourists throughout the year.

However, due to the temperate climate along the Polish coast, the peak of the tourist season occurs in July and August [11]. This is clearly reflected in the marked increase in visitor numbers to these areas and the resultant strain on transport and municipal infrastructure, particularly in terms of water supply, energy provision and sanitation, as well as the intensified demand for local catering, hospitality and healthcare services, and finally the increased activity of emergency rescue services, which are observed particularly during high season [12].

Figure 4. Map of the Polish Baltic coastline indicating the principal tourist resorts (source: own work based on Statistics Poland, https://stat.gov.pl/en/, accessed Apr. 29, 2025).

During the summer of 2024, the Polish Baltic coast recorded a substantial increase in tourist traffic [6]. In July and August, the accommodation establishments in coastal towns hosted a total of 2 million guests, representing 22% of all guests who used such facilities in Poland at all, during that period. Foreign visitors accounted for 18.3% of the total, of whom the largest contingent was Germans – 184 000 individuals. By comparison, in July and August 2023 coastal accommodations received 1.8 million tourists, resulting in 8 million overnight stays [13]. Compared to the same period in the previous year, the number of tourists was 0.6% lower, while the total number of overnight stays decreased by 4.8% [14].

The lack of systematic research on tourist safety in the Baltic Sea region, mentioned in Sect. 2, highlights the need for intensified studies in this area. The safety of tourists in the coastal regions of Poland is an issue of critical importance, particularly in light of the steadily increasing number of visitors to the Baltic Sea each year [6, 13, 14]. This is also especially important in the context of dynamic environmental, social, and political changes that may impact tourist safety in the region [15].

3.1 *Threatening factors affecting tourist safety*

The safety of tourists having leisure time in coastal regions can be assessed in terms of natural hazards, such as severe weather events [16], as well as risks resulting from human activity, including environmental degradation [17], overdevelopment, and other unsustainable coastal practices [18], notably excessive shoreline construction that disrupts natural littoral processes and the exploitation of natural resources without adequate protective mechanisms. These practices can lead to environmental degradation, loss of biodiversity, and deterioration of the conditions for tourists enjoying these regions [19].

A significant natural hazard for tourists relaxing by the Baltic Sea involves adverse weather conditions and natural phenomena. The Baltic Sea can be unpredictable, and sudden weather changes may pose a serious risk [20]. Strong winds, violent storms, and rough seas can generate high waves and powerful currents, endangering swimmers [21]. Rip currents are a dangerous threat, as they can unknowingly pull swimmers far from the shore, making it difficult to return safely. For instance, occurred in July 2022, when an accident like that took place in Jantar (small town on the Vistula Spit), where five people were swept away by powerful shore waves. Despite the presence of a red flag, indicating a swimming ban due to hazardous conditions, one person entered the water and began to drown. Beachgoers, attempting to form a "human chain" to rescue him, were themselves caught by the waves. As a result of this accident, one person lost their life and another was seriously injured [22].

The weather along the Polish coast is marked by sudden fluctuations that can be hazardous to tourists, particularly those who engage in water sports [16]. Although the Baltic Sea is generally regarded as a relatively calm body of water, it can also be unpredictable. Due to abrupt changes in atmospheric conditions, strong winds and storms may arise without warning, making the sea treacherous and posing a genuine threat to visitors. This volatility means that even in seemingly tranquil weather, conditions can shift instantaneously, increasing the risk for sailors and for those on or near the water. Moreover, an insufficient number of lifeguards [23] – especially on less frequented beaches – can significantly increase the likelihood of serious accidents and delay the provision of aid to those in distress [24, 25].

Tourists are also exposed to hazards arising from coastal erosion and unstable cliffs. Along the western shore, at the southern tip of the island of Wolin and extending eastward, there are cliff stretches several hundred metres in length, composed chiefly of glacial clays that undergo continual abrasion. Similar formations are found along the eastern coast in the vicinity of Jastrzębia Góra and Gdynia [26]. Intensive tourist activity, combined with natural factors such as variable weather conditions, storms and heavy rainfall, accelerates the degradation of these cliffs, potentially precipitating unpredictable landslides. Consequently, people walking near steep cliff edges may face the immediate peril of losing their footing or even being involved in an accident. For this reason, local authorities and rescue services maintain constant monitoring of the coastline in order to issue timely warnings of any imminent dangers [27]. For example, in Orłowo, Gdynia, in 2018 a section of the cliff collapsed, depositing approximately 1200 m^3 of earth onto the beach, although no injuries were sustained [28]. However, in April 2024 a tragic accident occurred when a 60-year-old man fell from the summit of this same cliff and lost his life [29], confirming that natural erosive processes can pose a severe hazard to those nearby.

Tourists are primarily attracted to the southern Baltic coast by its pristine maritime air, which promotes relaxation and rejuvenation. Although occasional episodes of pollution, such as during winter heating or in proximity to industrial zones, may occur, most visitors select these areas precisely for their natural charm and favourable climatic conditions. Research indicates [30], that, while air pollution can reduce the appeal of a destination, both through adverse health effects and degradation of environmental aesthetics, it is not always the decisive factor in destination choice. For many travellers, other regional assets, such as the quality of beaches, the purity of coastal waters and a rich cultural-recreational offering, assume greater importance. However, a growing number of individuals are aware of the risks posed by air pollution. Tourists, especially younger demographics and those who have a higher degree of ecological awareness, routinely monitor current air-quality data and may plan their visits to avoid periods or locations with elevated pollution levels. Adverse perceptions of air quality can cast a region in a less favourable light, thereby influencing holiday-making decisions [31]. However, air pollution not only influences tourists' decision-making and choice of destination. For example, studies conducted among students of tourism-related fields indicate that awareness of the issue of pollution may potentially affect their perception of the attractiveness of the tourism job market, as well as their destination preferences as future industry professionals [32], what seems to be critical, given chronic problem of high employee turnover facing tourism and hospitality

industry [33]. Air pollution is assessed based on measured concentrations of key substances, including particulate matter (PM10 and PM2.5), nitrogen oxides (NOx), sulphur dioxide (SO2), ozone (O3) and benzo[a]pyrene. These data are collected by monitoring stations (e.g., the Chief Inspectorate of Environmental Protection – CIEP in Poland, Pol. Główny Inspektorat Ochrony Środowiska – GIOŚ)) and by satellite systems, and the results are compared against established standards and guidelines [34]. The air quality in the Polish coastal tourist destinations is varied and depends on numerous factors, including local emission sources and meteorological conditions. The Tri-City metropolitan area (Gdańsk, Gdynia and Sopot), which is particularly susceptible to air pollution due to its proximity to major ports and shipyards, as well as its large population (approximately one million inhabitants) is, according to reports by the CIEP, annually awarded Category A for all monitored pollutants, indicating good air quality in this region [34]. Occasional short-lived episodes of poor air quality do occur, but these are generally transient [35, 36]. Small coastal towns may also experience occasional air quality problems, particularly during the heating season when emissions from domestic heating systems are elevated. The region of the southern Baltic Sea most affected by air pollution is the vicinity of Ostrowo, located just under 15 km west of Władysławowo (Fig. 4). Despite its seaside position, in January 2023 the air quality standards were breached there, with a maximum PM2.5 concentration of 82.10 μg/m³ and seven days on which the daily PM10 limit was exceeded [37].

Tourists along the Polish coast are also exposed to hazards arising from contamination of marine bathing waters by anthropogenic sources [19]. The sources of marine pollution are industrial, agricultural, and municipal waste inputs directly into the sea or through rivers. Within the Baltic Sea basin, seven major rivers: the Neva, Vistula, Oder, Nemunas, Daugava, Kemijoki and Göta transport pollutants originating from land and from intensive anthropogenic activities carried out there, accounting for more than 80% of marine pollution [38]. Because most of these rivers discharge into the southern Baltic Sea, pollutant concentrations are consequently higher in that region. Studies and reports on water quality and the occurrence of cyanobacterial blooms indicate that along the southern Baltic coast the highest risk of such blooms is found in the Gulf of Gdańsk and in the vicinity of Świnoujście, due to the outflows of the Vistula and Oder rivers. Although, in general, the water quality of the Baltic Sea along the Polish coastline is improving, sporadic cyanobacterial blooms, resulting from eutrophication, may nonetheless adversely affect the health of bathers and diminish the appeal as a tourist destination [8, 39]. The extent of cyanobacterial blooms in the Baltic Sea and the attendant public-health risks are lower than those posed by hazardous and toxic blooms in warm-water marine environments, such as off the coasts of the Caribbean, the Gulf of Mexico and parts of the Pacific. Nevertheless, they are most frequently cause skin irritation and foodborne illness. In extreme cases, cyanobacterial blooms prompt sanitary alerts: local health authorities in the affected area, where cyanobacteria concentrations have risen sufficiently, prohibit bathing to protect the well-being of residents and tourists. Unfortunately, some visitors nonetheless disregard these bans [40]. Although, compared to tropical regions, the magnitude of these events is smaller, their occurrence in the southern Baltic underscores the necessity of continuous monitoring of water-quality and the implementation of measures to mitigate eutrophication. For example, in July 2023 six bathing sites along the Polish coast were closed due to cyanobacterial blooms: three in Gdynia and one each in Jantar, Stegna and Kąty Rybackie on the Vistula Spit [41]. In addition to the nutrients, causing the cyanobacterial blooms, other salts using in agriculture, may be also move by rivers into the Baltic Sea. Pesticides and herbicides, as chemical agents used in agriculture to control pests and weeds, can enter bathing waters through surface runoff and infiltration into groundwater [42]. The waters contaminated by these substances pose serious threats to both aquatic ecosystems and to the health of tourists. Many small organisms, such as plankton, fish and crustaceans are particularly sensitive even to low concentrations of these compounds. Such pollution may disrupt reproduction, growth and the functioning of biological systems. Especially hazardous is the phenomenon of bioaccumulation, whereby these substances accumulate in living organisms lacking the capacity to eliminate them and subsequently transfer through successive trophic levels, thereby increasing risks for fish, birds and ultimately humans. Tourists visiting bathing sites may be exposed to pesticides through dermal contact with water, which, over time, can cause skin irritation or allergic reactions. Furthermore, the consumption of contaminated fish and other marine products carries the risk of hormonal disturbances and other long-term health effects [43–45]. Fortunately, although pesticides and herbicides can reach the Baltic Sea, available reports and studies have not documented any instances of mass poisoning of tourists by these substances along the southern Baltic coast.

Bathing waters may also be subject to a variety of contaminants that affect both the quality of the vacation experience and the health of tourists. Degradation of larger plastic debris and its direct release into the environment results in the accumulation of microplastics in coastal waters. Although these particles are small, they can be absorbed by aquatic organisms, thereby affecting the entire food chain. For tourists, the presence of microplastics may lead to a deterioration of the aesthetic appeal of bathing sites and pose potential health risks, especially during prolonged water contact and through the consumption of, for example, fish harvested from contaminated waters [46–48]. The waters of the Baltic Sea also exhibit the presence of heavy metal ions. These contaminants originate from industrial emissions, agricultural runoff and inadequately treated wastewater. Heavy metals such as lead, cadmium and mercury can accumulate in sediments and water, and their presence poses a risk to human health by affecting the nervous system, the kidneys and other organs [49]. Residues of pharmaceuticals and other medicinal products enter water bodies through sewage systems and improper disposal of medical waste. These substances can affect aquatic microorganisms by disrupting the ecological balance and may also pose potential health risks to individuals using bathing areas [50]. Even with operational treatment systems in place, partially

treated wastewater may occasionally be discharged into marine environments, thereby increasing the risk of the presence of pathogens, viruses, and toxins. Bathing waters are most commonly exposed to the presence of bacteria such as Escherichia coli and Enterococcus. Elevated levels of these pathogens pose a direct threat to tourist health, increasing the risk of infections and diseases that affect the respiratory or gastrointestinal systems [51, 52]. Exceeding the permissible levels of hazardous substances and foreign organisms leads to decisions regarding the closure of beaches in order to protect tourists' health. For instance, in August 2019, the presence of Escherichia coli and Enterococcus bacteria was detected at the Darłówko Zachodnie bathing site (approximately 30 km east of Mielno), resulting in the temporary closure of the beach [53].

Oils and greases represent another significant category of pollutants that can adversely affect the quality of bathing waters and the aesthetic appeal of beaches. The main sources of these substances are maritime transport as well as the operations of ports and shipyards [54, 55]. Ships, particularly those with high fuel throughput, may generate oily waste and minor fuel or lubricant leaks during normal operation, which can result from mechanical failures, improper handling, or accidental events during loading and unloading procedures. Oil slicks that settle on the surface not only reduce water clarity and hinder gas exchange between water and air, but also give the water an unsightly appearance and an unpleasant odour, thus deterring tourists from visiting the beach. Moreover, the long-term presence of such substances can disrupt local ecosystems by disrupting biological equilibrium and affecting the health of aquatic organisms. Direct contact with oil-contaminated water may cause irritation to the skin and eye among swimmers. In cases of larger-scale spills, there is a risk that toxic substances may enter the food chain, indirectly impacting the health of people who consume contaminated fish or other marine organisms. These pollutants are often difficult to remove, as oils tend to form persistent films on the surface that can spread over large areas due to currents, waves, and wind [56].

Another type of chemical pollution specific to the southern coast of the Baltic Sea is sunken weaponry, primarily originating from World War II [57]. This region contains a significant quantity of munitions resting on the seafloor, including chemical weapons such as mustard gas. Even minimal exposure to these substances can result in painful blisters and burns that may persist for extended periods, as well as serious damage to the eyes, respiratory tract, and gastrointestinal system. Although these submerged items remained inert for many years, the gradual process of corrosion and the deterioration of protective casings pose a risk of toxic leaks. On the other hand, layers of sediment that have accumulated on the seabed over decades act as a mechanical barrier, partially preventing the release of hazardous substances into the water column. For this reason, contact with sunken weapons occurred more frequently in the immediate post-war years. In the vicinity of Bornholm Island, a popular site for diving enthusiasts, there have been instances where divers accidentally discovered metallic fragments or containers of submerged munitions. Similar encounters have occurred along certain Polish beaches, where tourists swimming or walking along the shoreline came into contact with remnants of sunken weaponry. Additionally, anglers have reported finding fragments of weapons or munition containers near fishing areas. Currently, incidents involving injuries to tourists caused by sunken weapons are extremely rare. Nevertheless, a theoretical risk remains that intensive seabed operations could inadvertently disturb these materials, potentially resulting in the release of toxic substances [58]. If this occurs, sea currents in the Baltic may carry these substances toward coastal beaches, posing a serious threat. Therefore, seabed cleaning has become a high priority by some authorities [57, 59] to ensure the safety of both tourists and the local communities who enjoy the beaches and the sea.

In the southern Baltic region, there have been numerous incidents related to health risks faced by tourists who spend extended periods on beaches without adequate protection. One of the most common hazards includes sunburns, heat strokes, and dehydration, particularly during the summer, when high temperatures combined with intense UV radiation can lead to serious skin damage [60]. For instance, in Kołobrzeg, there have been reported cases of tourists requiring medical intervention due to severe sunburns, while in Międzyzdroje, incidents of heat stroke have been recorded among people unprepared for prolonged sun exposure [61]. Another health risk to tourists involves injuries caused by slippery piers, uneven boardwalks, and poorly maintained pathways near beaches. In coastal towns where high pedestrian traffic and large numbers of visitors often result in overcrowding, there have been documented cases of slips and falls on wet or uneven surfaces, leading to serious injuries [62, 63].

Human activity also has a significant impact on the safety of travellers. During the summer season, coastal towns attract large crowds of tourists, which increases the risk of theft and fraud [64, 65]. Densely populated beaches and tourist centres create favourable conditions for pickpocketing. Therefore, it is essential to remain vigilant regarding one's belongings. For example, in Sopot in January 2024, two men took advantage of a situation in which a tourist was helping an unconscious man to steal her wallet containing documents and cash [66]. During the St. Dominic's Fair, goods worth over 60,000 PLN disappeared from the market area, most of which were items stolen from seasonal vendors of clothing and jewellery [67]. According to police data, in 2023, the number of initiated proceedings concerning "theft of another person's property" increased compared to the previous year, with a particularly noticeable increase in coastal provincial police departments [68]. Tourist areas have also seen incidents of fraud involving false apartment rental offers, where tourists pay deposits and subsequently lose contact with the so-called "hosts" [69]. Another common scam is the "three-cup game," in which organised groups of skilled fraudsters invite tourists to play, manipulating the ball in such a way that every participant ultimately loses the money wagered [70].

In coastal towns, there is a noticeable increase in alcohol consumption, which contributes to incidents such as aggressive behaviour, irresponsible conduct in the water, and traffic accidents. For example, in June

2023 on Stogi Beach in Gdańsk, lifeguards and police officers rescued a beachgoer with nearly 3.5‰ blood alcohol content, who repeatedly disappeared underwater in an uncontrolled manner [71].

Unfortunately, the behaviour of such beachgoers can be difficult to predict and control. They often disregard not only social norms but also the recommendations of lifeguards. After consuming large amounts of alcohol, they may decide to swim or, worse, attempt to supervise a child in the water [23]. Another common issue involves intoxicated individuals drifting out to sea on inflatable mattresses. They often fall asleep and realise how far they have drifted once they wake up. Even more concerning is the fact that children are sometimes left unattended on these mattresses, posing a serious safety risk. Unfortunately, such beachgoers, being under the influence of alcohol, often refuse to cooperate and when confronted with lifeguards, frequently respond with aggression, including verbal abuse and insults [23].

Another issues arising from alcohol abuse among tourists are car accidents caused by intoxicated and drunk drivers. During the holiday season, coastal roads become heavily congested, leading to a higher number of collisions and accidents, particularly near popular resorts. For instance, in April 2025 in Darłowo, a woman with a blood alcohol level exceeding 2‰ drove her car into a ditch [72].

Another health risk for tourists, though not limited only to those visiting coastal regions, is the threat of diseases resulting from inadequate hygiene in accommodation and food service establishments. Tourists should exercise caution when consuming food sold at seasonal food stands, as high temperatures accelerate spoilage. For example, in June 2024, 122 people, including spa guests and staff members, were infected with salmonella at a vacation resort in Pogorzelica, resulting in the hospitalization of 8 tourists [73]. Similarly, in July 2023, sanitary inspections detected the presence of Escherichia coli in more than 40% of soft-serve ice cream samples sold along the coastal strip, leading to the temporary closure of numerous sales points [74]. During the 2024 season, inspections covered 90 samples collected from the coastal region of the West Pomeranian Voivodship in Poland, half of which were found to be contaminated with Escherichia coli [75]. The sanitary authority (so-called Sanepid in Poland) indicated that the main cause of contamination was the insufficient cleaning and disinfection of the ice cream dispensing machines, along with the lack of proper hygiene protocols during production.

Noise is an unwanted high-intensity sound that can negatively affect human health, well-being, and quality of life, as well as the natural environment. It is an acoustic phenomenon that disrupts natural tranquillity or communication in a given area. Consequently, noise at a destination, regardless of whether it comes from tourists, road traffic, or industrial activity, can significantly influence tourists' decisions when choosing where to travel [76]. Many tourists prefer locations that offer peace and relaxation, and therefore, high noise levels, particularly in areas designated for rest, can disrupt the overall comfort of their stay. Prolonged exposure to noise may lead to increased stress levels and have adverse effects on both physical and mental health. Tourists who prioritise their well-being may thus avoid destinations where noise is a persistent issue. In Poland, permissible noise levels vary depending on the type of area. In residential and recreational zones, acceptable daytime levels typically range from 55 to 65 dB, while night-time levels should not exceed 45 to 55 dB [77]. In many coastal towns in Poland, especially during the tourist season, noise levels often exceed these limits. Intense tourist traffic, mass events, increased vehicle movement, and the operation of food establishments all contribute to increased sound levels. In several resort towns along the southern coast of the Baltic Sea, measurements have indicated noise levels that can be considered a nuisance. However, it is difficult to definitively identify which Polish coastal town is most affected by noise pollution. Among the popular seaside destinations frequently mentioned in media reports and environmental protection agency findings are Sopot, Kołobrzeg, and Międzyzdroje. For example, in Sopot during the summer, especially in beach areas and along the promenade, sound measurements have shown average day-time levels of approximately 70 dB. In the evenings, during outdoor events and increased tourist activity, levels may temporarily exceed permissible limits, raising concerns among both residents and local authorities [78]. In another tourist city, Kołobrzeg, there have been instances where noise levels on the beach and near entertainment centres have reached up to 75 dB, particularly in the evenings when concerts, mass events, and intensified vehicle traffic, including service vehicles supporting tourist infrastructure, take place [79]. Meanwhile, in Międzyzdroje, summer measurements indicate average noise levels in recreational areas ranging from 65 to 70 dB [80]. Although these levels are slightly lower than those recorded in Sopot and Kołobrzeg, occasional exceedances still occur, especially during local events or near food service establishments.

Noise exerts detrimental effects not only on humans but also on animals. Marine birds, mammals, including endangered species inhabiting the Baltic Sea, such as seals and porpoises, and other organisms are particularly sensitive to sound. Noise can disrupt their communication, induce stress, and even force them to abandon their natural habitats. Furthermore, underwater noise, such as that generated by motorboats, can have an adverse impact on marine organisms by interfering with their spatial orientation and reproductive behaviours. This is especially concerning given that sound travels faster and over greater distances in water than in air, amplifying its disruptive potential [81].

Recently, some tourists visiting the Polish coast have expressed concerns regarding the planned construction of offshore wind farms [82]. The construction of offshore wind farms along the Polish coast is still in an intensive development phase, with a potential capacity of approximately 33 GW by 2040 [83], and may soon influence tourists' choices of vacation destinations [84]. Opinions on wind farms vary and depend on several factors, such as the appearance of the turbines, their location, and the personal preferences of visitors [85, 86]. Studies conducted in various countries, especially Europe, where tourism and wind energy development are growing rapidly, show a wide range of reactions [87–

89]. For some tourists, wind farms are an interesting addition to the landscape, giving it a modern character, while others see them as a disruption to natural views. However, attitudes toward offshore wind farms are generally more positive than toward onshore farms, primarily due to their location away from the shore [84, 90, 91]. Tourists who value an unobstructed view of the sea or enjoy water sports tend to have a favourable view of offshore farms, provided they are located far enough from the coastline to remain nearly invisible [84, 90, 91]. For environmentally conscious individuals, offshore farms symbolise a commitment to environmental protection, which can even improve the area's appeal as a tourist destination [84, 90, 91].

In addition to concerns about the disruption of scenic landscapes, tourists, prompted by reports on the potentially harmful effects of wind farms, including electromagnetic fields, noise, and the flickering caused by rotating blades, have expressed concerns about their personal safety, particularly in relation to onshore wind farms, which are concentrated along the Polish coast [92]. Therefore, the construction of new wind power plants, both offshore and onshore, may contribute and intensify conflicts within society: on the one hand, among tourists who, disapprove of such developments, may choose alternative destinations, and on the other hand, among local residents, who are not only concerned for their health but also aware of tourists' decisions to skip vacations at their resorts, may become dissatisfied due to the resulting decrease in income from accommodation rentals and hospitality services [93].

3.2 *Strategies to improve tourist safety*

Tourist safety is a fundamental criterion for assessing the quality of a destination's tourism offerings and the overall satisfaction of its visitors [94]. A well-designed and effectively implemented protection system not only enhances the comfort of the tourists' stay but also strengthens the reputation of a region or country as a safe, welcoming, and trustworthy tourist destination [8, 32]. On the Baltic coast, where mass tourism intensifies during the summer season, the need for effective preventive strategies becomes especially urgent. Ensuring tourist safety requires a multifaceted approach that includes both individual and institutional preventive measures, the integration of modern technologies, and close cooperation among relevant stakeholders [24].

The foundation of any effective safety system lies in a comprehensive risk assessment. This process should examine natural conditions, the dynamics of tourist flows, the state of local infrastructure, and potential environmental hazards [95]. Along the Baltic coast, special attention must be paid to meteorological threats (e.g., sudden storms, high winds, large waves), geodynamic risks (e.g., cliff erosion, landslides), and seasonal health threats (e.g., foodborne illnesses, cyanobacterial blooms) [96, 97]. During the peak season, the high number of visitors increases the likelihood of crimes such as pickpocketing and financial fraud. Tourists are advised to store valuables in hotel safes and carry essential items such as passports and wallets in interior pockets when in crowded areas. Cashless payment methods, including cards with contactless blocking technology, are recommended, along with avoiding bookings made through unverified websites [98]. Preventive efforts should include educating tourists about common scams, such as fake requests for assistance or phishing via text messages. Increased police and municipal patrols in tourist hotspots serve as an effective deterrent. Additionally, travellers may fall victim to fraudulent accommodation offers; therefore, it is essential to use reputable booking platforms and avoid suspicious deals is essential. Educational campaigns by local authorities and tourism organisations, through brochures in information centres and social media channels, play a vital role in raising awareness about such threats [64]. The ongoing monitoring of crime data from police and rescue services is necessary to identify emerging threats. These data support the development of preventive action plans, which outline patrol schedules, lifeguard deployments, and tourist guidelines.

Appropriate education and preparation before travel significantly reduce the risk of adverse incidents [99]. Tourists are advised to familiarise themselves with up-to-date meteorological bulletins, sanitary warnings (e.g., regarding water quality or hygiene standards in establishments), and the particulars of local regulations and customs. It is recommended to have adequate travel and medical insurance and to make photocopies of identity documents. The assembly of a first-aid kit equipped with basic analgesics, sunburn remedies, and rehydration supplies improves the ability to respond promptly to minor health issues. To maintain good health during seaside visits, tourists should use UV-protected sunscreen, stay well hydrated, and wear head coverings. People with sensitive skin should avoid prolonged exposure to the sun during peak UV hours. If symptoms such as nausea, vomiting, diarrhoea, or rash occur, immediate medical attention should be sought [60].

Water safety is another priority. Beach safety is maintained by the Polish Volunteer Water Rescue Service (Pol. – Wodne Ochotnicze Pogotowie Ratunkowe – WOPR), which conducts rescue operations and educational activities. Police and municipal guards ensure public order and discourage crime in popular resorts, while the Maritime Search and Rescue Service (SAR) provides an emergency response at sea. Coordinated actions among these services and local authorities ensure rapid response to emergencies and support the operation of medical and information centres [100]. Visitors should swim only in lifeguarded areas, observe flag-based warning systems (red – no swimming, yellow – caution, green – safe), avoid prohibited entry points and never enter the water after drinking alcohol [101]. They should also be educated about the safety of the rip current safety, namely, swimming parallel to the shore rather than against the current is key if caught in one. To enhance beach safety for families with children, it is recommended to use preventive wristbands. These are distributed by some WOPR units or can be purchased independently. These wristbands include the child's name and the parents' phone number [23]. Although small and inexpensive, they can be extremely helpful. During peak season, beaches are often very crowded, and many windbreaks look alike, making it difficult for a lost child to find their parents on their own. Such a

wristband significantly increases the chances of a quick and safe reunion. It is recommended to use preventive wristbands for children, which are distributed by some WOPR units or can be purchased independently. These wristbands include the child's name and the parents' phone number. Although small and inexpensive, they can be extremely helpful. The more that, during peak season, beaches are often very crowded, and many windbreaks look alike, making it difficult for a lost child to find their parents on their own. Such a wristband significantly increases the chances of saving the child quickly [23].

Sanitary and epidemiological safety includes not only rigorous food hygiene standards, but also regular inspections of accommodation and dining facilities. Tourists are encouraged to choose venues with positive reviews, current bacteriological certifications, and clear compliance with HACCP protocols [102, 103]. Automated ice cream dispensers must ensure regular maintenance and disinfection, while hospitality providers must conduct ongoing hygiene training for staff. Public health authorities should intensify inspections during the peak season [104]. In cases of food poisoning or allergic reactions, tourists should seek medical help and notify sanitary services to help track the source of contamination [105].

Environmental cleanliness is a critical aspect of tourist health and safety. Air and water quality should be continuously monitored using data from the Chief Inspectorate of Environmental Protection stations and HELCOM reports. This information should be shared with a wider audience through public health bulletins to raise awareness among tourists visiting polish coastal destinations. If cyanobacterial blooms or bacteriological contamination exceed safety limits, bathing areas must be immediately closed to the public and such information should be widely publicized to increase tourists' awareness of this environmental threats.

Environmental education also plays an essential role. Awareness and concern for the environment should also be fostered not only through education in schools, but also via preventive programs, and diverse, large-scale social campaigns [23]. These efforts should include disseminating information through the media, including social media, to reach the wider community. Moreover, tourists particularly, should be encouraged to reduce waste, respect protected areas and comply with local environmental regulations to help maintain a clean and safe recreational space. Modern technologies support these initiatives. Mobile applications offering real-time updates on weather, water quality, and medical services provide valuable support for travellers [106]. Pollution levels can be continuously monitored using platforms such as the AQICN Poland map (https://aqicn.org/map/poland/pl/). Surveillance systems on beaches and public spaces aid in early hazards, while storm-warning networks enable swift responses to emerging threats.

4 CONCLUSIONS

The Baltic Sea areas are rich in natural, landscape and health resort values, and therefore the vast majority of this area is characterized by extraordinary tourist attractiveness [1]. Therefore, in this context, ensuring the long-term quality of the natural environment, in addition to the quality of leisure experiences and the safety of tourists during their seaside holidays, is of great importance [94]. Unfortunately, the limited scope of research on tourist safety in the Baltic Sea region reveals a significant gap in the existing literature, particularly in light of the growing appeal as a travel destination. The complex interplay of environmental, geopolitical, and social factors unique to the Baltic Sea highlights the pressing need for a comprehensive and multidimensional approach to understanding and mitigating tourism-related risks. The more that, tourism continues to be a key driver of local economic activity in Poland's coastal regions.

In recent years, tourism has evolved into a widespread social phenomenon, influencing not only the lifestyles and leisure preferences of tourists visiting coastal areas but also having huge impact on the natural environment [1]. Coastal municipalities clearly recognise the advantages of leveraging their natural assets to stimulate tourism-oriented economic development. They utilise these resources to revitalise local markets driven by tourism. Unfortunately, the complexity and sensitivity of natural systems are often overlooked, especially in the face of destructive human activities driven by external pressures and the pursuit of rapid and short-term profits [1]. Thus, although the Baltic Sea is a popular holiday destination for millions of tourists, its fragile ecosystem is increasingly threatened by ongoing environmental degradation. If this continues, the appeal of the Polish seaside may strongly diminish, resulting in a serious economic decline [107].

One of the fundamental issues in many coastal areas is the insufficient understanding of their spatial development. The absence of clear behavioural models and comprehensive design guidelines often leads to random, uncoordinated actions that frequently result in the degradation, often irreversible, of the natural qualities of the environment [1]. To counteract this, it is essential to implement holistic protection plans and sustainable management strategies that respect the unique characteristics and natural processes of coastal regions. Such approaches offer an effective path toward developing tourism without compromising the ecosystems on which it fundamentally relies [1]. In contrast, hasty and poorly planned technical interventions that permanently alter the landscape are likely to lead to long-term failures in tourism development.

In addition, the growing focus on issues such as plastic pollution and waste management signals an increasing awareness of the need for long-term solutions to protect the ecological integrity. These insights can guide policymakers and industry stakeholders in designing targeted strategies that enhance regional resilience, support sustainable growth, and drive innovation in tourism practices.

Finally, although there is nothing reprehensible in taking advantage of the natural landscapes and using other goods of nature by tourists visiting coastal areas, there is a need to constantly emphasize them the importance of taking care of the surrounding nature [1], which allows the current generation to properly

preserve them for future ones. Therefore, adequate education is strongly recommended, to increase tourist sensitivity and their environmental awareness.

Reassuming, by promoting cross-sector collaboration, stakeholders can craft integrated strategies that balance economic development with environmental protection and visitor well-being in this sensitive and dynamic region. Thematic clustering reflects the multidimensional nature of tourism management challenges and opportunities in the Baltic Sea area. Inclusion of topics such as regional cooperation, environmental impact, infrastructure development, and health tourism points to a holistic perspective, one that considers both local priorities and global concerns.

As a closing note, the current study makes useful contributions to the existing knowledge underscoring the potential for the Baltic Sea region to serve as a valuable model for exploring sustainable tourism practices. Addressing the current lack of safety and threat-orientated studies could not only advance theoretical insights but also inform the development of practical frameworks for risk management in tourism. Therefore, future research should address the question of how to improve interdisciplinary collaboration, bringing together experts in marine sciences, tourism management, and risk assessment, in order to significantly strengthen both the safety and sustainability of tourism in the Baltic region.

REFERENCES

[1] D. Kwiatkowska and E. Marks, "Zagospodarowanie turystyczne terenów nadmorskich w Polsce – przykład Helu – Półwyspu Helskiego, Sopotu i Ustki," Zeszyty Naukowe. Turystyka i Rekreacja, no. 1(17), pp. 239–252, 2016.

[2] Pomorskie.travel, "Trójmiasto – Metropolia, która tętni życiem," Pomorskie.travel, Feb. 17, 2021. https://pomorskie.travel/artykuly/trojmiasto-metropolia-ktora-tetni-zyciem/ (accessed May 23, 2025).

[3] kolobrzeg.info.pl, "Historia Kołobrzeg – jaka jest historia, co warto wiedzieć?," kolobrzeg.info.pl, Apr. 2021. https://www.kolobrzeg.info.pl/atrakcje/historia-kolobrzeg (accessed May 23, 2025).

[4] K. Parzych, "The Polish Baltic coast as a tourist area in the light of tourism indicators," Studia Periegetica, vol. 32, no. 4, pp. 71–87, Dec. 2020, doi: https://doi.org/10.5604/01.3001.0014.6595.

[5] E. Hącia, „Analiza popytu na przewozy turystyczne w regionach nadmorskich w Polsce," Logistyka, vol. 3, pp. 771–777, 2012.

[6] Statistical Office. Statistics Poland, Tourist Accommodation Establishments in Coastal Areas in July and August 2024 [Online], Nov. 18.2024. Available: https://stat.gov.pl/en/topics/culture-tourism-sport/tourism/tourist-accommodation-establishments-in-coastal-areas-in-july-and-august-2024,5,40.html (accessed on 5 April 2025).

[7] A. Grobelna and K. Skrzeszewska, "Seasonality: Is it a problem or challenge facing future tourism employment? Implications for management," Journal of Entrepreneurship, Management and Innovation, vol. 15, no. 1, pp. 205–230, Feb. 2019, doi: https://doi.org/10.7341/20191518.

[8] A. Grobelna and M. Bogalecka, "Tourism and career development in the face of seawater threats: Understanding the perspectives of tourism and hospitality students from coastal areas," Sustainability, vol. 16, no. 23, p. 10351, Nov. 2024, doi: https://doi.org/10.3390/su162310351.

[9] SPAeden.pl, "Polskie wybrzeże Bałtyku – raj dla miłośników plaż i natury," Spaeden.pl, Jun. 20, 2024. https://spaeden.pl/podroze/polska/2942-polskie-wybrzeze-baltyku-raj-dla-milosnikow-plaz-i-natury (accessed May 23, 2025).

[10] Eurostat, "Eurostat," Europa.eu, 2011. Available: https://ec.europa.eu/eurostat/ (accessed Apr. 29, 2025).

[11] Gdańsk Tourist Organization, Gdańsk Tourist Organization's Report. April 2025, unpublished.

[12] Wojewódzka Stacja Pogotowia Ratunkowego w Szczecinie, "Więcej karetek nad morzem," Wojewódzka Stacja Pogotowia Ratunkowego w Szczecinie, Jun. 2021. https://www.999.szczecin.pl/wiecej-karetek-nad-morzem/ (accessed May 23, 2025).

[13] Statistical Office. Statistics Poland, Tourist Accommodation Establishments in Coastal Areas in July and August 2023 [Online], Nov. 16. 2023. Available: https://stat.gov.pl/en/topics/culture-tourism-sport/tourism/tourist-accommodation-establishments-in-coastal-areas-in-july-and-august-2023,5,39.html (accessed on 5 April 2025).

[14] Statistical Office. Statistics Poland, Tourist Accommodation Establishments in Coastal Areas in July and August 2022 [Online], Nov. 16. 2022. Available: https://stat.gov.pl/en/topics/culture-tourism-sport/tourism/tourist-accommodation-establishments-in-coastal-areas-in-july-and-august-2022,5,37.html (accessed on 5 April 2025).

[15] A. R. Kozłowski, J. Kempa, and R. Ciuffreda, "Evaluation of the safety policy of seaside tourist and spa towns in Poland," Quality & Quantity, Jan. 2025, doi: https://doi.org/10.1007/s11135-024-02046-x.

[16] M. Dolak, "Nowe zjawisko nad morzem. 'Prognoza pogody grozy'," WP Wiadomości, Jul. 2024. https://wiadomosci.wp.pl/nowe-zjawisko-nad-morzem-prognoza-pogody-grozy-7044471781923360a (accessed May 23, 2025).

[17] GdyniaSport.pl, "10 ton w jeden weekend - kto śmieci na plażach?" gdyniasport.pl, May 31, 2024. Available: https://www.gdyniasport.pl/pl/aktualnosci/10-ton-w-jeden-weekend-kto-smieci-na-plazach (accessed May 23, 2025).

[18] R. Socha, „Ukamienowane plaże, oszpecony Bałtyk. Jak Polacy zachłysnęli się tym, co zobaczyli na świecie", Polityka, Sep. 1, 2024. Available: https://www.polityka.pl/tygodnikpolityka/rynek/2268219,1,ukamienowane-plaze-oszpecony-baltyk-jak-polacy-zachlysneli-sie-tym-co-zobaczyli-na-swiecie.read (accessed May 23, 2025).

[19] A. Dobrzycka-Krahel and M. Bogalecka, "The Baltic Sea under anthropopressure — The sea of paradoxes," Water, vol. 14, no. 22, p. 3772, Nov. 2022, doi: https://doi.org/10.3390/w14223772.

[20] Bałtycka Głębia, "Sztormy nad Bałtykiem – kiedy występują?," baltyckaglebia.pl, Feb. 24, 2023. https://baltyckaglebia.pl/sztormy-nad-baltykiem-kiedy-wystepuja/ (accessed May 23, 2025).

[21] A. Rutgersson et al., "Natural hazards and extreme events in the Baltic Sea region," Earth System Dynamics Discussions, vol. 13, no. 1, pp. 251–301, Feb. 2022, doi: https://doi.org/10.5194/esd-13-251-2022.

[22] TwojaPogoda.pl, "Fala przybojowa porwała 5 osób w Jantarze. Odpłynęli w głąb morza. Czym jest to groźne zjawisko?," twojapogoda.pl, Jul. 13, 2022. Available: https://www.twojapogoda.pl/wiadomosc/2022-07-13/fala-przybojowa-porwala-5-osob-w-jantarze-trwa-akcja-ratownicza-czym-jest-to-grozne-zjawisko/ (accessed Apr. 29, 2025).

[23] M. Kosakowska, "Jest ratowniczką nad Bałtykiem. Wskazuje grzechy główne Polaków na plaży," WP Kobieta, Jul. 1, 2022. https://kobieta.wp.pl/jest-ratowniczka-nad-baltykiem-wskazuje-grzechy-glowne-

polakow-na-plazy-6785488808593952a (accessed May 23, 2025).
[24] A. Ostrowski, A. Stanula, and Z. Małodobry, "The role of prevention supported by innovations and implementations in increasing the safety of people staying in water areas," Scientific Journal of Bielsko-Biala School of Finance and Law, vol. 28, no. 1, pp. 128–139, Mar 2024, doi: https://doi.org/10.19192/wsfip.sj1.2024.19.
[25] T. Zalewski, "Assumptions for the strategy of development of the water safety system on Polish Baltic coast," Journal of Coastal Research, pp. 1306–1310, 2011, doi: https://doi.org/10.2307/26482386.
[26] M. Winowski, J. Tylkowski, and M. Hojan, "Assessment of moraine cliff spatio – temporal erosion on Wolin Island using ALS data analysis," Remote Sensing, vol. 14, no. 13, p. 3115, Jun. 2022, doi: https://doi.org/10.3390/rs14133115.
[27] E. Pranzini, G. Anfuso, and C. M. Botero, "Nourishing Tourist Beaches," pp. 293–317, Jan. 2018, doi: https://doi.org/10.1007/978-3-319-58304-4_15.
[28] Gdynia Nasze Miasto, „Dokładnie sześć lat temu tony ziemi spadły z klifu w Orłowie na plażę. Możliwe są kolejne osuwiska, nadal należy uważać!," Gdynianaszemiasto.pl, Feb. 15, 2023. Available: https://gdynia.naszemiasto.pl/dokladnie-szesc-lat-temu-tony-ziemi-spadly-z-klifu-w/ar/c1-9616455 (accessed Apr. 29, 2025).
[29] Dzień Dobry Pomorze.pl, "Spacer po klifie grozi niebezpieczeństwem! 17 kwietnia zginął mężczyzna," Dziendobrypomorze.pl, Apr. 21, 2024. Available: https://dziendobrypomorze.pl/pl/11_wiadomosci/62340_spacer-po-klifie-grozi-niebezpieczenstwem-17-kwietnia-zginal-mezczyzna.html (accessed Apr. 29, 2025).
[30] A. Jęczmyk, J. Uglis, and K. Kasprzak, "Zanieczyszczenie powietrza a turystyka," Polish Journal for Sustainable Development, vol. 23, no. 2, pp. 17–24, Jan. 2019, doi: https://doi.org/10.15584/pjsd.2019.23.2.2.
[31] A. Łapko, A. Panasiuk, R. Strulak-Wójcikiewicz, and M. Landowski, "The state of air pollution as a factor determining the assessment of a city's tourist attractiveness — Based on the opinions of Polish respondents," Sustainability, vol. 12, no. 4, p. 1466, Feb. 2020, doi: https://doi.org/10.3390/su12041466.
[32] M. Bogalecka and A. Grobelna, "Air pollution and its potential consequences for tourism and career development from students' perspective: A case study of the Gdańsk Agglomeration in Poland," International Journal of Environmental Research and Public Health, vol. 20, no. 3, p. 2651, Feb. 2023, doi: https://doi.org/10.3390/ijerph20032651.
[33] A. Grobelna and A. Tokarz-Kocik, "Work engagement and staff turnover in the hospitality industry: An analysis of selected job characteristics," International Entrepreneurship Review, vol. 11, no. 1, pp. 125–141, 2025, doi: https://doi.org/10.15678/ier.2025.1101.08.
[34] Main Inspectorate for Environmental Protection, Measurement Data Archives [Online]. Available: http://powietrze.gios.gov.pl/pjp/archives (accessed Apr. 29, 2025).
[35] M. Bogalecka, "Probabilistic approach to modelling, identification and prediction of environmental pollution," Environmental Modeling & Assessment, vol. 28, no. 1, pp. 1–14, Sep. 2022, doi: https://doi.org/10.1007/s10666-022-09854-1.
[36] M. Bogalecka, "Semi-markovian approach to modelling air pollution," in Safety and Reliability of Systems and Processes, Summer Safety and Reliability Reminar 2021, K. Kołowrocki, M. Bogalecka, E. Dąbrowska, and M. Torbicki, Eds. Gdynia: Gdynia Maritime University, 2021, pp. 31–44, doi: https://doi.org/10.26408/srsp-2021-03.
[37] Pomorski Alarm Ekologiczny, "Smog zadomowi się wszędzie. Nawet nad morzem! Pomorski Alarm Ekologiczny," Pomorski Alarm Ekologiczny, Feb. 13, 2023. Available: https://pomorskialarmekologiczny.pl/smog-zadomowi-sie-wszedzie-nawet-nad-morzem/ (accessed Apr. 29, 2025).
[38] HELCOM, "Input of nutrients by the seven biggest rivers in the Baltic Sea region 1995–2017," Baltic Sea Environment Proceedings [Online] 2021. Available: https://www.helcom.fi /wp-content/uploads/2021/09/The-seven-biggest-rivers-in-the-Baltic-Sea-Region.pdf (accessed Apr. 29, 2025).
[39] M. Bogalecka and M. Pigłowski, "An attempt to assess nutrients emissions from fertilisers on eutrophication in the Baltic Sea coastal zone," Maritime Security Yearbook, vol. XVIII, pp. 343–388, Nov. 2024, doi: https://doi.org/10.5604/01.3001.0054.8291.
[40] V. Baran, "Pijany plażowicz zaatakował ratownika WOPR w Sopocie. Nie spodobała mu się czerwona flaga," WP Wiadomości, Aug. 25, 2022. Available: https://wiadomosci.wp.pl/trojmiasto/pijany-plazowicz-zaatakowal-ratownika-wopr-w-sopocie-nie-spodobala-mu-sie-czerwona-flaga-6805144525511424a (accessed Apr. 29, 2025).
[41] A. Michalak, "W Bałtyku zakwitły sinice. Sanepid zamyka kąpieliska," Rzeczpospolita, Jul. 10, 2023. Available: https://www.rp.pl/spoleczenstwo/art38717701-w-baltyku-zakwitly-sinice-sanepid-zamyka-kapieliska (accessed Apr. 29, 2025).
[42] S. M. Rad, A. K. Ray, and S. Barghi, "Water pollution and agriculture pesticide," Clean Technologies, vol. 4, no. 4, pp. 1088–1102, Oct. 2022, doi: https://doi.org/10.3390/cleantechnol4040066.
[43] F. Sanchez-Bayo, P. J. van den Brink, and R. M. Mann, Eds., Ecological Impacts of Toxic Chemicals (Open Access). Bentham Science Publishers, 2012. doi: https://doi.org/10.2174/97816080512121110101.
[44] R. B. Schafer, P. J. van den Brink, and M. Liess, "Impacts of pesticides on freshwater ecosystems," in Ecological Impacts of Toxic Chemicals, F. Sánchez-Bayo, P. J. van den Brink, R. M. Mann, Eds. Bentham Science Publisher eBooks, 2011, pp: 111–137, doi: https://doi.org/10.2174/9781608051212111010111.
[45] S. L. Rumschlag et al., "Consistent effects of pesticides on community structure and ecosystem function in freshwater systems," Nature Communications, vol. 11, no. 1, p. 6333, Dec. 2020, doi: https://doi.org/10.1038/s41467-020-20192-2.
[46] A. Dereszewska, Katarzyna Krasowska, and M. Popek, "Microplastics in harbour seawaters: A case study in the Port of Gdynia, Baltic Sea," Sustainability, vol. 15, no. 8, pp. 6678–6678, Apr. 2023, doi: https://doi.org/10.3390/su15086678.
[47] A. Heimowska, "Problem mikroplastików w środowisku morskim," in Ekologiczne i Środowiskowe Aspekty Towaroznawstwa Jako Nauki o Jakości, M. Śmiechowska, Ed. Gdynia: Gdynia Maritime University, 2020, pp. 90–105.
[48] K. Krasowska and A. Heimowska, "Degradability of polylactide in natural aqueous environments," Water, vol. 15, no. 1, p. 198, Jan. 2023, doi: https://doi.org/10.3390/w15010198.
[49] K. Jomova, S. Y. Alomar, E. Nepovimova, K. Kuca, and M. Valko, "Heavy metals: toxicity and human health effects," Archives of Toxicology, vol. 99, pp. 153–209, Jan. 2025, doi: https://doi.org/10.1007/s00204-024-03903-2.
[50] A. Dereszewska and Stanislaw Cytawa, "Effect of diclofenac concentration on activated sludge conditions in a biological wastewater treatment plant," Water, vol. 15, no. 10, p. 1838, May 2023, doi: https://doi.org/10.3390/w15101838.
[51] Główny Inspektorat Ochrony Środowiska, „Oceny roczne," Ramowa Dyrektywa w Sprawie Strategii Morskiej, 2023. Available: https://rdsm.gios.gov.pl/pl/oceny-roczne (accessed Apr. 29, 2025).
[52] A. Dobrzycka-Krahel and M. L. Fidalgo, "Coastal bathing water quality in Portugal and Poland: Students'

perspectives of its importance," Water, vol. 17, no. 2, p. 174, Jan. 2025, doi: https://doi.org/10.3390/w17020174.
[53] Bankier.pl, "Kąpielisko w Darłówku zamknięte przez bakterię E.coli. To decyzja sanepidu," bankier.pl, Feb. 15, 2023. Available: https://www.bankier.pl/wiadomosc/Kapielisko-w-Darlowku-zamkniete-przez-E-coli-To-decyzja-Sanepidu-7709458.html (accessed Apr. 29, 2025).
[54] HELCOM, Oil Spills Affecting the Marine Environment: Core Pressure Indicator Report [Online] 2023. Available: https://indicators.helcom.fi/wp-content/uploads/2023/04/Oil-spills-affecting-the-marine-environment-assessment_Final_April_2023.pdf (accessed Apr. 29, 2025).
[55] M. Bogalecka, Consequences of Maritime Critical Infrastructure Accidents. Environmental Impacts. Modeling – Identification – Prediction – Optimization – Mitigation. Amsterdam: Elsevier, 2020.
[56] K. C. Hellstrøm, Bøyla crude oil – properties and behaviour at sea – in relation to oil spill response, SINTEF Materials and Chemistry Oil Spills Research, SINTEF Ocean [Online] 2016. Available: https://sintef.brage.unit.no/sintef-xmlui/handle/11250/2449123 (accessed Apr. 29, 2025).
[57] T. Knobloch, J. Bełdowski, C. Böttcher, M. Söderström, N.-P. Rühl, J. Sternheim, "Chemical munitions dumped in the Baltic Sea," Baltic Sea Environment Proceedings [Online] 2013. Available: https://helcom.fi/wp-content/uploads/2019/10/Chemical-Munitions-Dumped-in-the-Baltic-Sea-Report-of-the-ad-hoc-Expert-Group.pdf (accessed Apr. 29, 2025).
[58] WP Turystyka, "Bałtyk zatruty! Co z wakacjami?," WP Turystyka, Jun. 21, 2013. Available: https://turystyka.wp.pl/baltyk-zatruty-co-z-wakacjami-6063815836652673a (accessed Apr. 29, 2025).
[59] Hello Mierzeja, "Oczyszczanie dna Bałtyku z broni i amunicji chemicznej," Hellomierzeja.pl, Sep. 07, 2021. https://www.hellomierzeja.pl/pl/blog/oczyszczanie-dna-baltyku-z-broni-i-amunicji-chemicznej (accessed May 23, 2025).
[60] E. Pranzini, G. Pezzini, G. Anfuso, and C. M. Botero, "Beach safety management," in Beach Management Tools – Concepts, Methodologies and Case Studies, C. Botero, O. Cervantes, and C. Finkl, Eds. Springer, Cham, 2018, pp. 397–420, doi: https://doi.org/10.1007/978-3-319-58304-4_20.
[61] M. Góralska, "Upały dają się we znaki. Ile stopni maksymalnie może wytrzymać ludzkie ciało? Jaka temperatura to już za gorąco," Strona Zdrowia, Jul. 25, 2023. Available: https://stronazdrowia.pl/upaly-daja-sie-we-znaki-ile-stopni-maksymalnie-moze-wytrzymac-ludzkie-cialo-jaka-temperatura-to-juz-za-goraco/ar/c14-17749691 (accessed Apr. 29, 2025).
[62] Urząd Miasta Ustka, "Raport o stanie Gminy Miasto Ustka za 2023r." Biuletyn Informacji Publicznej, Jun. 2024. Available: https://bip.um.ustka.pl/a,33544,raport-o-stanie-gminy-miasto-ustka-za-2023-rok.html (accessed Apr. 29, 2025).
[63] Urząd Miasta Kołobrzeg, „Strategia rozwoju miasta Kołobrzeg," Biuletyn Informacji Publicznej, Apr. 2024. Available: https://bip.um.kolobrzeg.pl/m,30653,strategia-rozwoju-miasta-kolobrzeg.html (accessed Apr. 29, 2025).
[64] A. Lisowska, "Zjawisko przestępczości w destynacjach turystycznych. Przegląd badań," Turyzm/Tourism, vol. 27, no. 1, pp. 33–43, Jun. 2017, doi: https://doi.org/10.18778/0867-5856.27.1.04.
[65] G. Gołembski, Ed., Kompendium wiedzy o turystyce. Warszawa: PWN, 2009.
[66] Trojmiasto.pl, "Okradł kobietę, kiedy udzielała pomocy," trojmiasto.pl, Jan. 11, 2024. Available: https://www.trojmiasto.pl/wiadomosci/Okradl-kobiete-kiedy-udzielala-pomocy-n185435.html (accessed Apr. 29, 2025).
[67] A. Szymczewski, „Kradzież na Jarmarku na ponad 60 tys. zł," trojmiasto.pl, Jul. 28, 2022. Available: https://www.trojmiasto.pl/wiadomosci/Kradziez-na-Jarmarku-na-ponad-60-tys-zl-n169294.html (accessed Apr. 29, 2025).
[68] Policja online, „Kradzież cudzej rzeczy," Statystyka, 2023. Available: https://statystyka.policja.pl/st/przestepstwa-ogolem/przestepstwa-kryminalne/7-wybranych-kategorii-p/kradziez-cudzej-rzeczy/121942,Kradziez-cudzej-rzeczy.html (accessed Apr. 29, 2025).
[69] J. Ratajczak, „Turyści, uwaga. To popularne oszustwo nad Bałtykiem. Polacy dają się naciąć na spore kwoty", Gazeta.pl, Aug. 9, 2024. Available: https://podroze.gazeta.pl/podroze/7%2C114158%2C31216183%2Cturysci-uwaga-to-popularne-oszustwo-na-wakacjach-policja.html (accessed Apr. 29, 2025).
[70] chroberz.pl, "Popularne oszustwo nad Bałtykiem: turyści tracą pieniądze, ale biznes kwitnie", chroberz.pl, Dec. 17, 2023. Available: https://chroberz.info/serwis/index.php/aktualnosci/aktualnosci-pod/137-promocyjne/5764-popularne-oszustwo-nad-baltykiem-turysci-traca-pieniadze-ale-biznes-kwitnie (accessed Apr. 29, 2025).
[71] P. Piesik, „Pijany plażowicz na Stogach pchał się do wody. Uratowali go ratownicy i policjanci", Zawsze Pomorze, Jun. 26, 2023. Available: https://www.zawszepomorze.pl/artykul/8983%2Cpijany-plazowicz-na-stogach-pchal-sie-do-wody-uratowali-go-ratownicy-i-policjanci (accessed Apr. 29, 2025).
[72] K. Warczak, „Wjechała pojazdem do rowu. Miała ponad 2 promile alkoholu", Komenda Powiatowa Policji w Sławnie, Apr. 18, 2025. Available: https://slawno.policja.gov.pl/zsl/aktualnosci/aktualnosci/72372,Wjechala-pojazdem-do-rowu-Miala-ponad-2-promile-alkoholu.html (accessed Apr. 29, 2025).
[73] PAP, "Wczasy nad Bałtykiem przerwane. Masowe zatrucie 122 osób. Sanepid podał przyczynę: salmonella", Rynek Zdrowia.pl, Jun. 20, 2024. Available: https://www.rynekzdrowia.pl/Polska-i-swiat/Wczasy-nad-Baltykiem-przerwane-Masowe-zatrucie-122-osob-Sanepid-podal-przyczyne-salmonella%2C259862%2C15.html (accessed Apr. 29, 2025).
[74] A. Rokicka-Żuk, „Bakterie kałowe w lodach z automatu. Zamknięto lodziarnie nad polskim morzem. Sanepid ostrzega przed zatruciami pokarmowymi", stronazdrowia.pl, Jul. 17, 2023. Available: https://stronazdrowia.pl/bakterie-kalowe-w-lodach-z-automatu-zamknieto-lodziarnie-nad-polskim-morzem-sanepid-ostrzega-przed-zatruciami-pokarmowymi/ar/c14-17727225 (accessed Apr. 29, 2025).
[75] poradnikzdrowie.pl, „Bakterie E-coli w lodach z automatu. Najgorzej jest nad morzem", poradnikzdrowie.pl, Jul. 17, 2024. Available: https://www.poradnikzdrowie.pl/aktualnosci/bakterie-e-coli-w-lodach-z-automatu-najgorzej-jest-nad-morzem-aa-Tjky-ojW6-iWqN.html (accessed Apr. 29, 2025).
[76] N. Arani, M. Karrabi, and A. Mohammadzadeh Moghaddam, "Observational and statistical evaluation of factors affecting traffic noise: A case of tourist, pilgrimage and business area," Applied Acoustics, vol. 193, p. 108750, May 2022, doi: https://doi.org/10.1016/j.apacoust.2022.108750.
[77] Regulation of the Minister of the Environment of 14 June 2007 on permissible noise levels in the environment, Journal of Laws 2007, No. 120, item 826.
[78] esopot.pl, "Tu jest naprawdę głośno! Sprawdź, gdzie w Sopocie hałas jest problemem", Esopot.pl, Apr. 18, 2023. Available: https://esopot.pl/pl/11_wiadomosci/16885_tu-jest-naprawde-glosno-sprawdz-gdzie-w-sopocie-halas-jest-problemem-mapy-.html (accessed Apr. 29, 2025).
[79] J. Szablewska-Wiraszka and M. Dąbrowska, Mapa Akustyczna Miasta Kołobrzeg w Otoczeniu Drogi Wojewódzkiej nr 102 [Online], 2010. Available: https://wios.szczecin.pl/bip/files/EB004790AFB44BD986293B464A900E87/Kołobrzeg.pdf (accessed Apr. 29, 2025).

[80] Rada Miejska w Międzyzdrojach, „Uchwała nr XXVIII/335/20 Rady Miejskiej w Międzyzdrojach w sprawie przyjęcia Programu Ochrony Środowiska dla Gminy Międzyzdroje na lata 2021-2024 z perspektywa do roku 2028," Biuletyn Informacji Publicznej, Nov. 2020. Available: https://bip.miedzyzdroje.pl/pliki/miedzyzdroje/zalaczniki/18552/uchwala-nr-xxviii-335-20.pdf (accessed Apr. 29, 2025).
[81] A. N. Popper and A. D. Hawkins, The Effects of Noise on Aquatic Life. New York, NY: Springer, 2012.
[82] D. Rudolph, "The resurgent conflict between offshore wind farms and tourism: Underlying storylines," Scottish Geographical Journal, vol. 130, no. 3, pp. 168–187, May 2014, doi: https://doi.org/10.1080/14702541.2014.914239.
[83] Morska Energetyka Wiatrowa – Portal Gov.pl," Morska Energetyka Wiatrowa, 2025. Available: https://www.gov.pl/web/morska-energetyka-wiatrowa/ (accessed Apr. 29, 2025).
[84] E. Chomać-Pierzecka, "Investment in Offshore Wind Energy in Poland and Its Impact on Public Opinion," Energies, vol. 17, no. 16, p. 3912, Aug. 2024, doi: https://doi.org/10.3390/en17163912.
[85] M. A. Petrova, "From NIMBY to acceptance: Toward a novel framework – VESPA – For organizing and interpreting community concerns," Renewable Energy, vol. 86, pp. 1280–1294, Feb. 2016, doi: https://doi.org/10.1016/j.renene.2015.09.047.
[86] M. Bogalecka, „Morskie farmy wiatrowe a ekosystemy morskie – dwukierunkowe oddziaływania w cyklu życia", in Wybrane Zagadnienia Zarządzania Ryzykiem w Przemyśle Offshore, A. Blokus-Dziula, Ed. Gdynia: Gdynia Maritime University, 2025, pp. 118–143.
[87] K. Gee and B. Burkhard, "Cultural ecosystem services in the context of offshore wind farming: A case study from the west coast of Schleswig-Holstein," Ecological Complexity, vol. 7, no. 3, pp. 349–358, Sep. 2010, doi: https://doi.org/10.1016/j.ecocom.2010.02.008.
[88] J. Ladenburg, "Attitudes towards on-land and offshore wind power development in Denmark; choice of development strategy," Renewable Energy, vol. 33, no. 1, pp. 111–118, Jan. 2008, doi: https://doi.org/10.1016/j.renene.2007.01.011.
[89] V. Westerberg, J. B. Jacobsen, and R. Lifran, "The case for offshore wind farms, artificial reefs and sustainable tourism in the French mediterranean," Tourism Management, vol. 34, pp. 172–183, Feb. 2013, doi: https://doi.org/10.1016/j.tourman.2012.04.008.
[90] J. Firestone, W. Kempton, M. B. Lilley, and K. Samoteskul, "Public acceptance of offshore wind power across regions and through time," Journal of Environmental Planning and Management, vol. 55, no. 10, pp. 1369–1386, Dec. 2012, doi: https://doi.org/10.1080/09640568.2012.682782.
[91] C. Haggett, "Understanding public responses to offshore wind power," Energy Policy, vol. 39, no. 2, pp. 503–510, Feb. 2011, doi: https://doi.org/10.1016/j.enpol.2010.10.014.
[92] B. Beach, J. Glasson, B. Durning, and K. Welch, The Impacts of Offshore Wind Farms on Local Tourism and Recreation: A Research Study [Online], 2021. Available: https://group.vattenfall.com/uk/contentassets/c66251dd969a437c878b5fec736c32aa/tourism-impact-of-offshore-wind-farms---final-report----jg-300921.pdf (accessed Apr. 29, 2025).
[93] Agnieszka Wartecka-Ważyńska, "The impact of onshore wind farms on the tourist value of the environment in the opinion of Poland's inhabitants. Analysis of secondary empirical research results," Economics and Environment, vol. 85, no. 2, pp. 395–419, Sep. 2023, doi: https://doi.org/10.34659/eis.2023.85.2.542.
[94] K. Majchrzak, and A. Tokarz, Indywidualne determinanty wyjazdów turystycznych, in: Obsługa ruchu turystycznego, B. Meyer, Ed. Warszawa: PWN, 2006, pp. 24–38.
[95] M. Casal-Ribeiro, I. Boavida-Portugal, R. Peres, and C. Seabra, "Review of crisis management frameworks in tourism and hospitality: A meta-analysis approach," Sustainability, vol. 15, no. 15, p. 12047, Aug. 2023, doi: https://doi.org/10.3390/su151512047.
[96] A. Rutgersson et al., "Natural hazards and extreme events in the Baltic Sea region," Earth System Dynamics Discussions, vol. 13, no. 1, pp. 251–301, Feb. 2022, doi: https://doi.org/10.5194/esd-13-251-2022.
[97] A. D. Dávila-Lamas, J. J. Carbajal-Hernández, L. P. Sánchez-Fernández, V. B. Niebla-Zatarain, and C. A. Hoil-Rosas, "Assessment of coastal locations safety using a fuzzy analytical hierarchy process-based model," Sustainability, vol. 14, no. 10, p. 5972, Jan. 2022, doi: https://doi.org/10.3390/su14105972.
[98] S. Singh, V. Rana, and S. N.A., "Hotel safety and security services: understanding multi-criteria characteristics and guest satisfaction," International Journal of Tourism Policy, vol. 14, no. 6, 2024, doi: https://doi.org/10.1504/ijtp.2024.10067041.
[99] S. Alvarez, F. Bahja, and A. Fyall, "A framework to identify destination vulnerability to hazards," Tourism Management, vol. 90, p. 104469, Jun. 2022, doi: https://doi.org/10.1016/j.tourman.2021.104469.
[100] A. R. Kozłowski, J. Kempa, and R. Ciuffreda, "Evaluation of the safety policy of seaside tourist and spa towns in Poland," Quality & Quantity, Jan. 2025, doi: https://doi.org/10.1007/s11135-024-02046-x.
[101] E. Meinhard, Drowning by Accident. Troubador Publishing Ltd, 2022.
[102] B. Leftwich, S. T. Opoku, J. Yin, and A. Adhikari, "Assessing hotel employee knowledge on risk factors and risk management procedures for microbial contamination of hotel water distribution systems," International Journal of Environmental Research and Public Health, vol. 18, no. 7, p. 3539, Mar. 2021, doi: https://doi.org/10.3390/ijerph18073539.
[103] K. Velaoras, A. N. Menegaki, S. Polyzos, and K. Gotzamani, "The role of environmental certification in the hospitality industry: Assessing sustainability, consumer preferences, and the economic impact," Sustainability, vol. 17, no. 2, p. 650, Jan. 2025, doi: https://doi.org/10.3390/su17020650.
[104] J. C. Lee, A. Daraba, C. Voidarou, G. Rozos, H. A. E. Enshasy, and T. Varzakas, "Implementation of food safety management systems along with other management tools (HAZOP, FMEA, Ishikawa, Pareto). The case study of Listeria monocytogenes and correlation with microbiological criteria," Foods, vol. 10, no. 9, p. 2169, Sep. 2021, doi: https://doi.org/10.3390/foods10092169.
[105] M. Castro, K. Soares, C. Ribeiro, and A. Esteves, "Evaluation of the effects of foods training on the microbiological load present in equipment, surfaces, utensils, and food manipulator's hands in restaurants," Microorganisms, vol. 12, no. 4, p. 825, Apr. 2024, doi: https://doi.org/10.3390/microorganisms12040825.
[106] S. Dinkoksung et al., "A mobile solution for enhancing tourist safety in warm and humid destinations," Applied Sciences, vol. 13, no. 15, p. 9027, Jan. 2023, doi: https://doi.org/10.3390/app13159027.
[107] D. Czyżewski, "Czyżewski: Jeśli nie zadbamy o Bałtyk, będziemy tracić miliardy rocznie," Biznes Alert, Jan. 18, 2024. https://biznesalert.pl/polska-morze-baltyckie-ekosystem-srodowisko (accessed May 23, 2025).