

# Environmental Impacts on the German Blitzkrieg in World War II

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## Abstract

The Blitzkrieg was the combined use of tanks, air craft and infantry hitting hard and fast to seize the initiative in World War II. While there have been other avenues pursued by historians for understanding the Blitzkrieg, few have focused on the role of the environment played one of the most important factors in the implementation of the blitzkrieg. This paper uses primary and secondary sources pertaining to all of the aspects of the Blitzkrieg, from the common infantry man, to the Panzer divisions, and also the Luftwaffe. With all of these elements, the environment played possibly the most important factor in the success or failure of German blitzkrieg tactics. From the Panzer Vs becoming bogged down in the mud during Operation Barbarossa, to the Luftwaffe becoming grounded due to severe snow storms or fog during the Battle for Britain, the environment played the most direct role in determining the outcome of each situation. Other evidence suggests that the German High Command knew of the environmental conditions and tried to evade them.

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The Blitzkrieg was the German tactic of hitting the enemy hard and fast. It required a combined assault from aircraft and armored units to push through the enemy as fast as possible, while the infantry advanced to hold the objective. The impacts of the Blitzkrieg on the environment are undeniable, but I started to wonder about the impact of the environment on the ability to conduct the Blitzkrieg. In this paper I have set out to test modern notions of the Blitzkrieg, and to find how the environment impacted the whole of the German operations. Most secondary sources omit the importance of environmental factors on the outcome of battles, so I will be relying mostly on primary sources from World War Two. I will focus on the environmental impacts first in Operation Sea Lion and then in Operation Barbarossa. The environment, from the weather to the conditions of the terrain, was planned for by the Nazi high command for the Blitzkrieg tactic. Even with all of the meticulous plans set in motion by the high command, the environment was still one of the most unpredictable factors that could either help or hinder battlefield operations.

To date, there have been numerous areas of research into the Blitzkrieg, but most of these are focused on the actual tactics, such as the units involved in specific battles using the Blitzkrieg tactic, or on the origins of the term Blitzkrieg. In Dietrich Orlow's book *A History of Modern Germany*, Orlow talks briefly about the Global Blitzkrieg. He presents evidence that this Global Blitzkrieg was hindered by the fact that the battlefield Blitzkrieg had failed. He explains that the entire idea of the Global Blitzkrieg was to take out the allied powers quickly, and then the rest of the world would eventually fall. This idea was directly based off of the splendid results of the Blitzkrieg on the western front. While this is true, Orlow does not expound on how the Blitzkrieg failed. He says "the Third Reich's inability to defeat the Soviet Union in the most important part of the Global Blitzkrieg sealed the fate of Nazi Germany" showing that the aspects that affected the Blitzkrieg in Russia also impacted the Global Blitzkrieg. He could be referring to the impact of the environment on particular battles, but does not go into detail over the specifics. The same unpredictable factor that ruined key engagements in the war also destroyed the dream of the *Global Blitzkrieg*.<sup>1</sup>

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<sup>1</sup> Dietrich Orlow, *A History of Modern Germany*, vol. 7th (Boston: Pearson, 2012). 205 - 12.

William J. Fanning's 1997 article, discusses the tactics of the Blitzkrieg, but does not talk about the physical conditions of the environment as a factor in deciding the outcome of each engagement. He states a "typical description [of the Blitzkrieg] includes fifth column activity behind enemy lines, massive air strikes to disrupt the enemy's ability to fight back, armored thrusts, and the use of motorized artillery and infantry. This incorporates the strategic concept of a decisive blow to gain a quick victory as well as the tactical means to achieve it."<sup>2</sup> This is the general way the Blitzkrieg has been thought about and discussed since World War Two. Fanning also inquired about the origin of the term Blitzkrieg, and how the different terms used until World War Two could have turned into Blitzkrieg. He concluded that the Blitzkrieg was already doctrine before the war, but that there is no way to find who created the term or a precise date that this term was coined. He goes on to say that the idea of a Blitzkrieg was evident in all the major European countries before the outbreak of war.<sup>3</sup> In Henry Reilly's 1940 article, he sets up the base for this line of thought by explaining how the Blitzkrieg was tested in World War One, and grew to its modern form in World War Two.<sup>4</sup>

Another crucial aspect of research was published in 2004 by Robert Citino. He looked into the technology used by the vehicles in the Blitzkrieg. Without understanding the technology, it is a mystery how all the units were able to work so effectively together on the constantly changing battle field. Citino focuses on one of the most decisive technological innovations of the war, the radio, without realizing the reason for the development and implementation of better technology, such as the "Y" system radio, was because of the impending fog encountered so often by the Luftwaffe.<sup>5</sup>

Like Fanning, Citino also fails to consider the environment as a main factor in his research. This gap in the research is why I decided to start researching the impacts of the environment on the ability to implement the Blitzkrieg tactics. I argue that understanding the battlefield environment is critical in understanding the Blitzkrieg. However, the impacts of the natural environment have been almost completely overlooked. Environmental historians have looked at the impacts of war

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<sup>2</sup> William J. Fanning, "The Origin of the Term Blitzkrieg: Another View," *The Journal of Military History* 61, no. 2 (1997).

<sup>3</sup> Ibid.

<sup>4</sup> Henry J. Reilly, "Blitzkrieg," *Foreign Affairs* 18, no. 2 (1940).

<sup>5</sup> Robert Citino, "Beyond Fire and Movement: Command, Control and Information in the German Blitzkrieg," *Journal of Strategic Studies* 27, no. 2 (2007).

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on various environments. Matthew Evenden has studied how the aluminum commodity chain during World War Two negatively affected environments and ecosystems all over the world. His main argument is that total war has a deeper environmental impact beyond the damage to the battlefields. It is important to understand the environmental costs of warfare, but his broad study lacks insight pertaining to the environmental factors affecting various battles during the war.<sup>6</sup>

In my research, I have found that many aspects of the natural environment hindered but also sometimes helped, German operations. I have also found evidence that the German High Command understood some of the risks and weighed all the factors to try to keep the initiative, even in the failed Russian campaign in June 1941, Operation Barbarossa.<sup>7</sup> From this failed Russian operation, the public assumes that Hitler and the German High Command repeated Napoleon's failed conquest into Russia. Many sources would lead people to think this way. One of the very popular Youtube series, Epic Rap Battles of History, made a three part Hitler versus Darth Vader rap that received over seventeen million views. One line stated by Darth Vader says, "Didn't Napoleon let you know? When you conquer Russia better pack some ... winter clothes" which leads the public to assume the Germans did not remember Napoleon's failed conquest into Russia.<sup>8</sup> The public has assumed that there was a lack of planning for this Russian operation, where the Germans actually had considered all the factors from the equipment needed to the terrain and natural environment that would be encountered by their troops.

Hagen Schulze's 1998 book *Germany: A New History*, demonstrates that the Blitzkrieg tactics of early war were extremely successful and that this was "a triumph for Hitler's strategy." It is undeniable that the Blitzkrieg was necessary in taking the initiative and was a great success for the Germans. The way that Schulze explains these early territorial gains is that they were quick with no set-backs. This leads me to assume that the environment in Germany and the surrounding country side were ideal for the Blitzkrieg. The fact that the High Command realized the state of the terrain and that these tactics were perfect for the western front shows that this really was a triumph for their strategy. Schulze also briefly explains that the plan to

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<sup>6</sup> Matthew Evenden, "Aluminum, Commodity Chains, and the Environmental History of the Second World War," *Environmental History* 16, no. 1 (2011): 69 - 93.

<sup>7</sup> Rob Wheeler, ed. *German Invasion Plans for the British Isles 1940* (Oxford University Press, 2007).

<sup>8</sup> Nice Peter, *Hitler vs. Vader 3, Epic Rap Battles of History, Season 3* (Marker Studios, 2013).

invade Britain ultimately failed by implying that a Blitzkrieg by sea was not possible. I decided to take Schulze's argument further by exploring if the environment was responsible for the failure of the invasion. This was a very short explanation, so I turned to the 1940 Invasion of Britain, or Operation Sea Lion, for an explanation why.<sup>9</sup>

The Invasion of Britain plans included very detailed observations of the British mainland's natural terrain and environmental conditions. The High Command knew about every natural barrier in the countryside, and even had studied where the Blitzkrieg tactics that had won them the initiative in continental Europe could be implemented. The plans translated into English state "only in the marshy areas of some estuaries and parts of the coast are significant gaps to be found; motorized units will encounter difficulties here." This shows that the men in charge knew about the British terrain, and had detailed plans to make sure the Blitzkrieg would be successful.<sup>10</sup> It also shows how much faith the command had in the ease of the natural environment in England. However the biggest problem with Operation Sea Lion was Germany had an insufficient Navy to get all the troops and supplies over to England, and with the fog layer that had been hindering the German and British fliers since the beginning of the war, there would be little to no air cover available to help in the invasion. Without the combined armor and air attacks, the Blitzkrieg could not be possible.

The Operation Sea Lion plans also show that the High Command planned out every aspect of their areas of operations to be sure that the terrain would work for the Blitzkrieg. The same careful consideration that was put into Operation Sea Lion was put into the planning of Operation Barbarossa. The German High Command understood the risks of a winter war, and they were convinced that the Blitzkrieg would be just as decisive in the war on Russia. The German army was able to push all the way to Moscow in the summer months without running into any major environmental resistance. The 2003 book *Tigers in the Mud* by Otto Carius gives plenty of evidence that the initial push was successful. He gives a first-hand account of many battles, in which he and his Panzer V's, also known as Tigers, would push through the Russian defenses, while the infantry followed behind to hold the recently won objectives. His account of the attack against the "Judennase hill" shows a military map, of the situation and goes through his encounter at the battle (Figure 1). He

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<sup>9</sup> Hagen Schulze, *Germany: A New History* (Harvard University Press, 1998).

<sup>10</sup> Wheeler, *German Invasion Plans for the British Isles 1940*.

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explains how the four tigers would hit the Russian forces fast from the front in a spearhead formation, while the infantry followed right behind to clear the trenches. The terrain of the hill impeded all flanking strategy, since there was only one natural path that could even be used by mobile units of any kind. The significance of this one pathway made the entire battle very costly for the German forces, and eventually it became only a minor victory.<sup>11</sup>

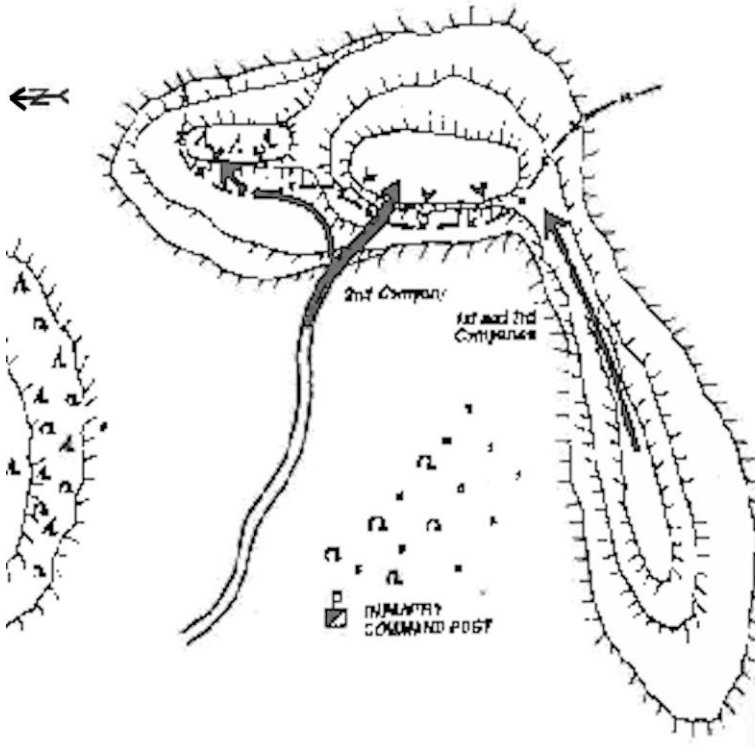


Figure 1. Attack on Judennase Hill

Experienced officers like Carius and the High Command understood the environmental aspects of war, but not every officer in the army by this late in the war had received sufficient training in defensive tactics. Carius explains that the new commander in this area of Russia did not understand the significance of the natural terrain, and shortly after the “Judennase hill” was re-occupied by the Russians. Had that officer

<sup>11</sup> Otto Carius, *Tigers in the Mud* (Stackpole Books, 2003). 137 - 45.

understood that the environmental conditions during this battle could have been used to better defend the hill, then the Russian forces would not have been able to as easily taken back the hill in the Russian counterattack. Had the new German commander used the environment to his advantage, this hill could have been the launching point for another push using the Blitzkrieg tactics.

The Germans at this stage of the war were mobilizing their reserve troops when the Blitzkrieg began to stall and more fighting men were needed for the war effort. The notion that the High Command and Hitler were repeating Napoleon's mistake is false, since the Germans had planned for the environment in Russia and had better tactical advantages in their Russian campaign. The Germans only ran into major environmental challenges during the fall and winter, when deep mud and rains washed out what little infrastructure Russia had, along with the frigid cold and snow storms of the Russian winters.<sup>12</sup>

The decision to retreat was always risky because there is no way to scout out a path first to see if it can withstand the mobile troops. This is when the environment really impeded all of the elements of the Blitzkrieg. Part of the Blitzkrieg tactic would be to pull back if the supply chain could not keep up with the armored spearhead, making a tactical withdrawal necessary at certain times. The after action report in 1943 by Eugen Brüning gives a detailed account of his retreat when the Blitzkrieg stalled and Russian forces overran German forces. Brüning talks about how he and his men were running through the woods, and all of them became bogged down in mud. He says "in the woods there was an endless marsh ... that with every step [we] sank more than knee deep in the mud" showing how hard it was slogging through the mud, and how the environment had impeded their retreat from the overrun area. Before reading this report, I had never actually heard of an infantry unit becoming bogged down in such a way. He goes on to say it took his men thirty minutes to get through this mud and shortly after they had to cross the iced over lake that was nearby. This shows how something as simple as mud can have a tremendous effect on military tactics and movement.<sup>13</sup>

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<sup>12</sup> Ibid.

<sup>13</sup> Eugen Brüning, "Abschrift After Action Report," (1943).

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It is difficult to imagine that the environment could have such a big impact on mobile units, such as tanks and armored personnel carriers. The 2010 book *Panzer der Wehrmacht* by Alex Lüdeke has a brief description of each armored unit used by the Germans between 1933 until 1945, and gives a complete analysis of each tanks strong points and weak points. When reading these statistics, it becomes easy to see how the Tiger tank driven by Carius and others could get bogged down so easily. The Tiger was a heavy tank and weighed 55,000 kilograms making it very susceptible to getting stuck in mud. Another heavy tank, the Panther, in comparison weighed only 44,800 kilograms. Some medium tanks, such as the Panzer IV, only weighed 23,600 kilograms. Light tanks, such as the Panzer 35 T, weighed only 10,500 kilograms.<sup>14</sup> This evidence, along with Carius's accounts of the war, tell me that the Blitzkrieg was well planned out, as it was primarily an offensive strategy, to use the terrain and work with the environmental factors in the area of operations (Figure 2).



Figure 2. A Tiger tank stuck in the mud.

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<sup>14</sup> Alex Lüdeke, *Panzer der Wehrmacht* (Stuttgart, Germany: Paul Pietsch Verlage, GmbH & Co., 2010). The Tiger, officially labeled as Kpfw. VI Ausf. E Sd. Kfz. 181, the Panther, labeled the PzKmfw. V Ausf G. Sd. Kfz. 171, the Panzer IV, PzKpfw. IV Ausf. F2 Sd. Kfz. 161/1, and the Panzer 35 T, labeled PzKpfw. 35 (T).



The High Command, like in the British invasion plans, had planned out the best routes that could support the heavy armor columns. It is only when the units must withdraw from a particular area that the environment becomes unpredictable, and starts to hinder the war effort. This shatters the notion that the High Command and Hitler did not learn from Napoleon's mistakes, because each retreat for every unit cannot possibly have a contingency plan predicted by the High Command.

Another major factor generally overlooked by historians is the impact of the weather in battlefield operations. The fog and snow can have detrimental effects on aircraft and all combined operations requiring a cohesive attack. In the 1953 translated diary *I Flew for the Führer* by Heinz Knoke, he talks about how the Blitzkrieg worked early on in the Russian campaign. He wrote that "Russian transport columns [had] been observed by our reconnaissance aircraft retreating... with our tanks in hot pursuit. We are to support them by bombing and strafing the Russians as they retreat. The [Stukas] are to dive-bomb the Russian artillery in the same area."<sup>15</sup> This shows how powerful the tactic was, but whenever the snow flurries came in, the German planes would be grounded, meaning the tanks and infantry would be on their own, trying to take their objectives without this critical support. Carius even goes so far as to name a chapter in his book is titled "The German fighters didn't show" and goes on to say "Unfortunately, as usual, there wasn't anything to be seen of our flyboys" during the battle for the "Judennase."<sup>16</sup> This evidence shows how powerful the environmental factors were on these sensitive machines of war, and how hard it could be to attempt the Blitzkrieg with only two-thirds of the required forces.

The German High Command also learned from early in the war that the effect of fog could really hinder their radio communications, which is especially necessary to complete a victorious Blitzkrieg. Without the ability to communicate new orders quickly and precisely, the forward units cannot be used as effectively, and cannot be warned of environmental changes in their areas of operation. Knoke explains that in a heavy fog over the coast of England, that all of the radios stopped working. If the equipment is not working, then every unit becomes less effective. Knoke writes about his selection to join a battalion testing a new "Y" system of radio, which has dedicated staff teams with new equipment that can track enemy movements and immediately coordinate with the troops in the air

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<sup>15</sup> Heinz Knoke, *I Flew for the Führer* (New York: Henry Holt and Company, 1953).

<sup>16</sup> Carius, *Tigers in the Mud*: 146 - 50.

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or on the ground. With this “Y” system the fog could not interfere with the transmissions, therefore eliminating some of the environmental factors hindering the Blitzkrieg. Even with this new radio system, the snow storms and blizzards still interfered with communications. This just proves the power and ever changing state of the environment. The environmental impacts on the ability to communicate could at times be devastating, if not just frustrating.<sup>17</sup>

Robert Citino’s article attributes the success of the Blitzkrieg entirely on the use of the radio and the ability to react in an instant. He states that with the use of the radio, the Germans could create the “formation of two great pincers” and that if ever a heavily defended position was encountered, that the High Command could call in an “air attack, rapidly, [and] instantaneously summoned by [the] radio” showing that without the radio, the Blitzkrieg was bound to fail.<sup>18</sup> This explains the reasoning behind the “Y” system, because when the environment begins to break up communication, the High Command must do everything in its power to overcome those obstacles. The use of the radio and the development of the “Y” system show that the German leaders were not only competent in their duties, but also studied the ever changing situation on the front lines and reacted accordingly. Without the newer technology, the German Blitzkrieg would not have had nearly as much success, and the environment would have been able to at times completely halt the German offensive.

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<sup>17</sup> Knoke, *I Flew for the Führer*.

<sup>18</sup> Citino, "Beyond Fire and Movement."

The environment played a major role in shaping the outcome of almost every engagement in World War Two. From fog and snow keeping the German Luftwaffe grounded and blocking radio communications, to tanks becoming bogged down in the mud, the environment made all of the engagements in the war unpredictable. The German High Command came up with extensive plans like Operation Sea Lion and Operation Barbarossa that researched the terrain to try to counteract the unpredictability of the environment, but to no avail. The Blitzkrieg still ran into problems due to bad weather or natural barriers that contained heavily defended positions. The invention of new technologies, including the “Y” system radio, shows the vigilance of the High Command to keep the initiative in the war and overcome the environmental problems they encountered. Such a major role in the war has been overlooked by historians, and I believe that we need to dedicate more research into the impact of the environment on the Blitzkrieg to refute the modern conception of the lack of planning of the German war machine by the Nazi high command. Without a study of the impacts of the environment on the Blitzkrieg, we can never fully grasp the operations of World War Two.

Jonathan Dillon Kuhl is a senior at Utah State University majoring in history with an emphasis on modern Europe and pursuing a minor in the German language. After graduation he plans to apply for graduate school and further his historical career.

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