IDS 300W

Interdisciplinary Theory & Concepts

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Putting a Stop to Wildfires

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BLUF:

The main goal of this paper is to devise a permanent solution to stop wildfires in North America. This will be done by using an interdisciplinary research approach and gathering various perspectives to help find both common ground and conflicted viewpoints to create an entirely new solution.

Introducing the Topic-

Wildfires have been a constant issue in North America since the 19th Century. Numerous mitigation techniques have been and still are being used/created as time passes. Still, the main question of this paper is "What is the best interdisciplinary approach to effectively stop wildfires in North America and be taught to future generations?". The complexity of this problem comes with the usage of fire prevention as well as the teaching of it to the public, which can help mitigate the problem, but there still is the factor that a margin of the public will ignore these teachings and can still cause wildfires to happen. This brings in the thought process of how exactly this problem can be solved. Given the severity level, this problem's importance is to be considered "post haste".

A Justifiable Approach-

As stated in the previous section, the complexity of stopping wildfires comes with establishing a well-thought-out approach that can help permanently stop them, as well as viewing the situation from different perspectives. The approach that is going to be used in this paper is to look at how wildfires have affected people residing near it (i.e. the aftermath of the incident), what causes of wildfires can be found more prominently throughout society and nature, as well as the mentioning of other countries to gain various perspectives on the matter, and see what preventive measures have already been taken to mitigate wildfires. With the observation of different perspectives, there will be multiple insights from disciplines, such as sociology, psychology, environmental sciences, and even material sciences. Although these disciplines have addressed the effect of wildfires, they still don't comprehensively address a permanent solution. But that shouldn't waver the thought of denying these disciplines as a whole.

Looking into Sociology and/or Psychology-

With addressing the disciplines being used for this topic, the first focus is sociology and psychology. Starting with sociology, which is the study of human society and social behavior, wildfires can often be associated with danger and would cause people to evacuate from the vicinity. This can play a factor in why wildfires haven't been more focused on due to the constant threat agent within a person's mind to run away and not deal with the issue at hand. But this can also correlate with how psychology is a more "thought-provoking" discipline for this topic. The psychological discipline of wildfires can be incited from the effects of it (i.e. post-traumatic stress, mental health effects, etc.). The paper "Psychological Effects of the 2017 California Wildfires on Children and Youth with Disabilities." by Elizabeth Ducy, et. al, 2021, dives more into said effects and psychological reactions from wildfires and interviews with the people affected by them. But the main takeaway from these disciplines is that wildfires can leave traumatic exposure and severely adjust our reactions/behavior to future incidents.

Considering Environmental Sciences-

With the reactionary behavior caused by wildfires being discussed, there is also the inclusionary discipline of Environmental Sciences and its perspective on the environmental impact of wildfires. Environmental Sciences, in this case for wildfires, focuses on the impact of human-ignited wildfires and other causes that can damage the ecosystem. The paper "Environmental Conditions, Ignition Type, and Air Quality Impacts of Wildfires in the Southeastern and Western United States" by Steven Brey, et. al, 2018, goes into how various factors and weather conditions may start wildfires. Although other considerable effects can cause wildfires to start and spread, the research results from this paper and others that can be found from various empirical resources, conclude that human factors (e.g. fire in-prevention) are the

main cause. There is also supplementary material that can support this conclusion, that being the paper "Wildfires as Collateral Effects of Wildlife Electrocution: An Economic Approach to the Situation in Spain in Recent Years" by Francisco Guil, et. al, 2018, which discusses how the development of electrical power lines near forested areas in Spain and the electrocution of birds from said power lines could cause wildfires. Although this research is taking place in Spain, it can still give insight into how human factors play a more primary role in wildfires. The idea behind this discipline is to evaluate the area of concentration where wildfires can start. With said ideas, researchers can gather more information that can be proven of value to firefighters and anyone who would volunteer to mitigate wildfires.

Evaluation of Material Sciences-

The ecosystem has been heavily affected by wildfires, leading to a decrease in wildlife and plant deterioration, but there is still the subject of material sciences and its discipline on what can be used to prevent this. With the association of wildfires, the material sciences discipline can be used to evaluate the procedures and techniques used to mitigate said wildfires. One paper "Dropping Fire Retardants by Helicopter and Its Application to Wildfire Prevention near Electrical Transmission Lines" by Jiazheng Lu, et. al, 2023, discusses the overall effectiveness of various flame retardants and compares and contrasts each of them respectively with mitigating wildfires near electrical grids. Similar to the previous section, this paper doesn't take place in North America but in China instead, but it can still give insight into finding a proper solution to wildfires. Without summarizing more of the paper, the overall consensus that the results have given is that flame retardants should be focused on more to create a better variant to decrease the number of wildfires, with the efficient 10% Class A flame retardant + 0.6% guar gum being the most effective in practice. The idea behind the usage of flame retardants can be seen as optimistic (i.e. thinking outside the box). It gives off a bias that there can still be some kind of way to prevent wildfires more effectively. Whether it's by creating reactionary chemicals, or even the simple usage of water, the material science discipline can be of use to help create new perspectives on mitigation techniques.

Common Ground & Confliction-

Having discussed the relevant disciplines that could give insight into stopping wildfires, there's still the discussion of common ground, as well as what conflicts come with comparing each discipline with each other. The first subject that can be found within each discipline is the primary factor of humans. When it comes to evaluating what causes can start wildfires, the evidence from multiple sources indicates that human factors are the main threat. Whether it's by not watching diminished campfires, or even the misuse of fire start equipment, it can all be pointed towards human factors. Another common subject that's included is the reactionary behavior from wildfires. Although this subject is more so focused on the psychology discipline, it can still be found with other disciplines to give awareness of the "sheer scale" of the dangers of wildfires.

After including common ground, there's still the debate of conflict between disciplines. One conflict that appears is the methodology for mitigating wildfires. As stated in the material sciences section, dropping flame retardants onto wildfires has proven effective. However, there's also a conclusory stance from the environmental science section that the prevention of urban development in forested areas can also be proven effective. This conflict can have even more methods within it, but the main premise is that finding a singular, agreeable solution would have to take time the world doesn't have given the increase in wildfires. Another conflict that is shown is the solutions to the aftermath of wildfires. While the psychology and sociology disciplines focus more on giving therapeutic resources to victims of wildfires, the other disciplines focus more on recovering areas that have been damaged by wildfires. Another similar conflict to this is the terms of priority on what should be focused on during wildfires. With there being different disciplines covering different perspectives, the decision on what the solution to stopping wildfires is is either relying on the focus of social behavior of either people recovering or interacting with said wildfires or the environmental impact that is resulting from the wildfires. Although these conflicts either focus on people or the land, in the end, those that have been displayed can still help create a better perspective on what should be focused on to prevent wildfires.

Redefining Disciplines-

Given the disciplines that have been shown throughout this paper, there is still the need for a more comprehensive understanding of them and how they have relevant importance in perspective. North American Wildfires have always been a problem that's been tackled by numerous researchers throughout history, but due to various conflicting thoughts/insights, there still hasn't been a permanent solution to stop them. To create a better understanding of this problem, there needs to be common ground between each aspect of research to help create a singular, agreeable solution. As discussed in this paper, there's already common ground with how human factors are the main cause of wildfires, but that doesn't comprehend what should be done about it. There are already established fire prevention techniques that have been taught so on and so forth, but that can only be "useful" for a finite amount of time. What needs to be done is to create a proper fire prevention education system that can be taught and advised to the general public without any negligence. Although this solution does sound effective, it still doesn't factor in how to properly stop wildfires that have already started. The insights discussed previously have concluded that fire retardants are the primary method for preventing wildfires, but this method can only mitigate their size for a short period. Thus there comes the solution on how to permanently extinguish wildfires.

Applying the Methods-

To give a permanent solution to stopping wildfires, there must be a discussion as to what methodology can be applied. With the research that's been done within this paper, the proposed solution can be acted out by first having a flame retardant that is mainly composed of potassium chloride, guar gum, ammonium carbonate, disodium hydrogen phosphate, and is adjusted to a specific gravity of 1.1 by water, as referenced in the paper "Dropping Fire Retardants by Helicopter and Its Application to Wildfire Prevention near Electrical Transmission Lines" by Jiazheng Lu, et. al, 2023. It would be dropped by helicopters into the center of the wildfire radius to help reduce the primary source of the fires. There would then be the use of local firefighters to go and isolate the remaining sources of fire by either chopping down trees that have been damaged already to help "keep back" the fire or by spreading dry chemical powder on certain areas. The next step would be the usage of water that has been collected before the incident either by rain, filtered, etc., which would then be air-dropped onto any remaining fires. Finally, there would be the implementation of a wildfire aftermath recovery unit, in which third-party resources would be used to help people inflicted by wildfires and give them a "sound mind" and have any available resources that people need (e.g. toiletries, housing, etc.), as well as therapeutic methods to calm people in stressful behaviors. There will also be the aforementioned fire prevention education system that can be implemented into the public school system to help teach future generations what to do in case wildfires occur.

Closing Thoughts-

Coming to the end of this paper, there has been evidence that preventing wildfires is imperative to both the ecosystem and society. Implementing a policy that can teach and allow access to necessary resources to stop wildfires would be the primary goal in the future. But there is also the recommendation of gaining insight into various disciplines that allow researchers to see a new perspective on how to stop wildfires, whether it's by reviewing the psychology of wildfire aftermath, or even the material science of creating flame retardants. Even if there is bias, the main takeaway from this paper is that stopping wildfires creates a positive image that can improve psychological/sociological effects on society and create a much healthier ecosystem that perhaps could adapt to the damage that has already been done. The cooperation of organizations/resources is an important priority, even if it will take a prolonged amount of time.

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