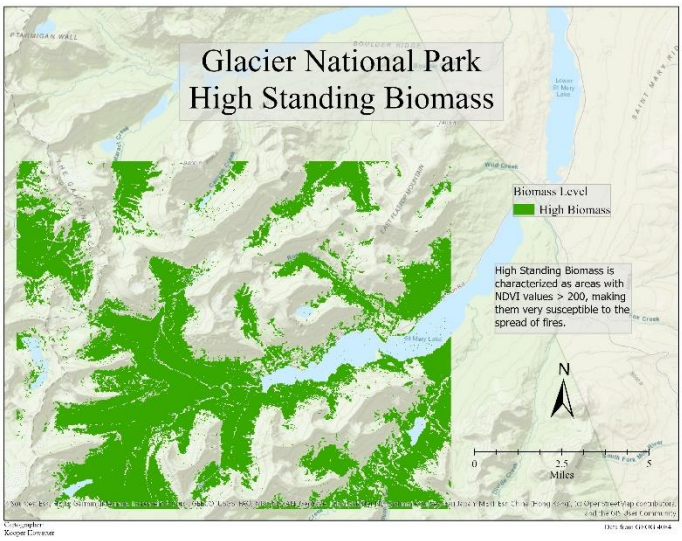
Kooper Howerter

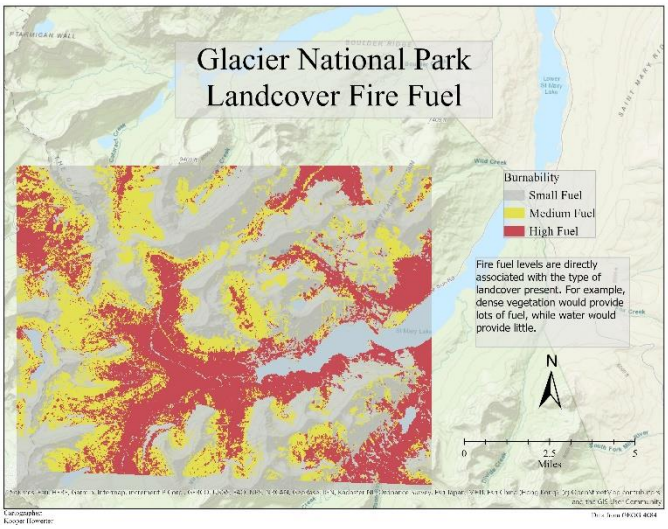
Glacier National Park Fire Risk Report

When analyzing the fire risk in our study area, we evaluated six factors that all have an impact on the potential for forest fire, as well as its severity and ability to spread. Each of these factors: biomass, landcover type, steep slope angles, slope aspect towards winds, presence of trails, and proximity to water were evaluated individually to determine their impact on fire, then all the data was combined to create one final shapefile and map that determines how fire prone the area is in regards to all six contributing factors.

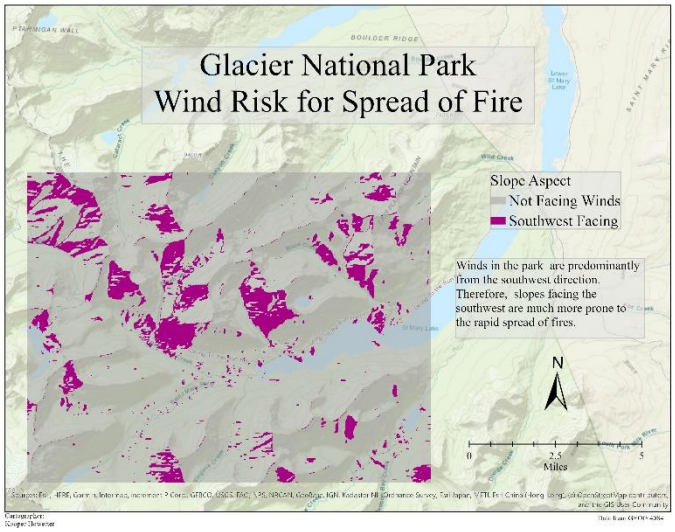
To combine all the factors, a hierarchy of importance was created, dependent on how much each of the six factors impacts fire in comparison to the others. This hierarchy was used to assign percentages of impact values to each of the factors, totaling to 100%. For example, we know that biomass and landcover type are extremely vital for fire's success, so the greatest percentages were assigned to these factors. The assumption was made that other factors, like slope aspect and angle contribute to fire in a smaller way, so smaller values were assigned to them. All of the individual data was altered to be on the same scale from 0-1, with higher values being more of a risk. The final step was multiplying the data of the 6 individual factors by their respective weights (totaling to 1.0 or 100%) in the raster calculator for our composite output.

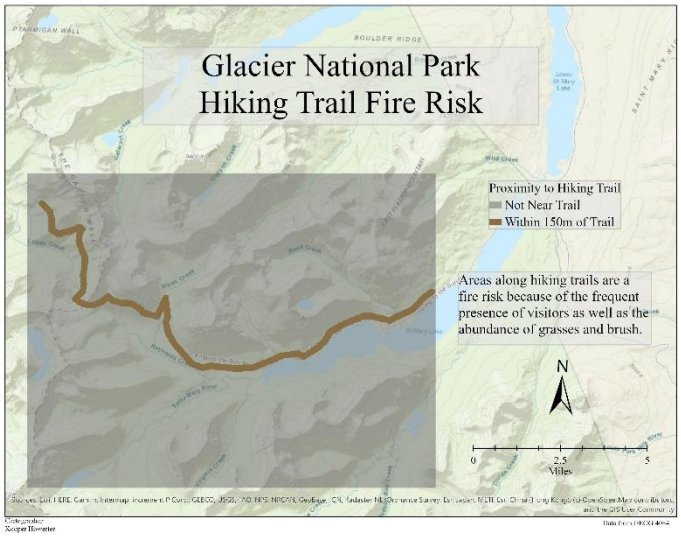
The final output and map provide a great summary of overall fire risk when compared to the individual risk factors. When we look at the distinct, dark red 'hotspots' on the map, they are found in areas that have all or most of the risk factors (i.e. dense vegetation, far from water, near trails, etc.) These areas stick out very well from the low risk areas, and based on the data I would highly suggest that these areas be monitored closely and that systems are put in place nearby to respond quickly to fires in the very likely chance that they break out.

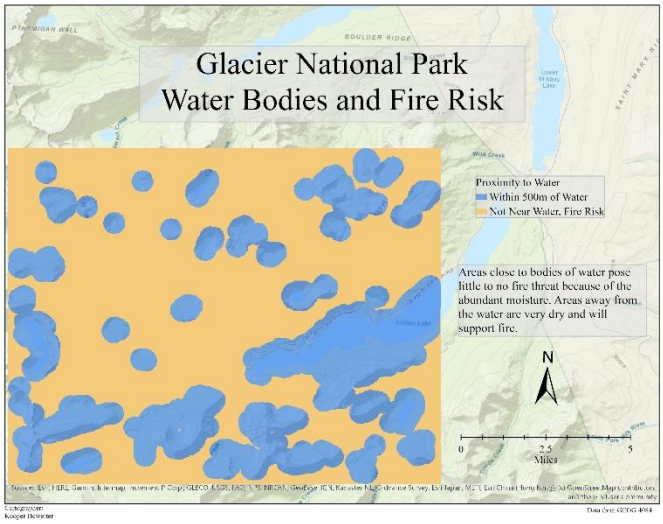

Glacier National Park
High Standing Biomass
Biomass Level
High Biomass
High Standing Biomass is characterized as areas with NDVI values > 200, making them very susceptible to the spread of fires.
N
0
2.5
5
Miles

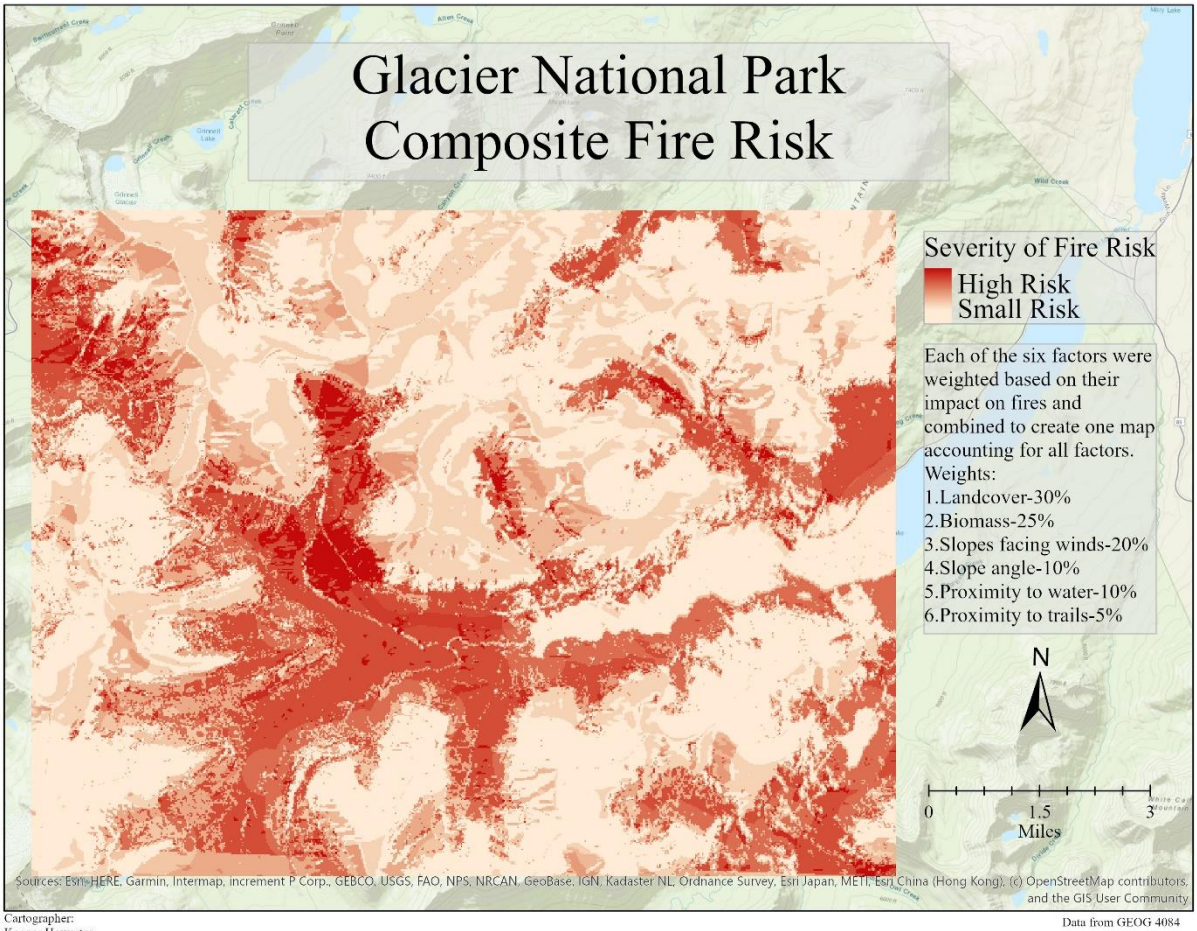

Glacier National Park
Landcover Fire Fuel
Burnability
Small Fuel
Medium Fuel
High Fuel
Fire fuel levels are directly associated with the type of landcover present. For example, dense vegetation would provide lots of fuel, while water would provide little.
N
0
2.5
5
Miles


Glacier National Park
Slope Fire Risk
Slope Degrees
< 35
> 35
Fires spread rapidly up slope, so areas with a higher slope are a higher fire risk.
N
0
2.5
5
Miles


Glacier National Park
Wind Risk for Spread of Fire
Slope Aspect
Not Facing Winds
Southwest Facing
Winds in the park are predominantly from the southwest direction. Therefore, slopes facing the southwest are much more prone to the rapid spread of fires.
N
0
2.5
5
Miles


Glacier National Park
Hiking Trail Fire Risk
Proximity to Hiking Trail
Not Near Trail
Within 150m of Trail
Areas along hiking trails are a fire risk because of the frequent presence of visitors as well as the abundance of grasses and brush.
N
0
2.5
5
Miles


Glacier National Park
Water Bodies and Fire Risk
Proximity to Water
Within 500m of Water
Not Near Water, Fire Risk
Areas close to bodies of water pose little to no fire threat because of the abundant moisture. Areas away from the water are very dry and will support fire.
N
0
2.5
5
Miles



Cartographer:
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Data from GEOG 4084