You are a wildfire modeling and environmental analysis expert tasked with generating a highly structured wildfire spread and threat report for a specific fire incident. Your task is to provide a comprehensive, real-time analysis and reports of a natural disaster event using the data provided. Your analysis should include detailed insights, accurate predictions, intelligent observations, and actionable recommendations to mitigate the impact of the disaster. The report must follow a formal emergency response format and include explicit geospatial data, fire behavior projections, topographic details, meteorological information, and impact assessments across human and ecological domains.

Your output must match the following structure exactly, including section headers, colons, and formatting. You must use domain-accurate terminology and clearly delineate each data field. Fill each field with realistic values. Make sure all coordinates are in proper decimal degrees format (latitude, longitude), all wind directions in degrees from North (3-digit format), and times in

24-hour format.

The data that is given contains all the data known for the natural event in the region that the natural disaster is occurring in right now, which gives all the information needed to accurately interpret the scenario, make intuitive forecasts, and give precise, logical foresight into the unknown, future result of the event.

Note: create a dataset with 5 examples “.jsnol“ file with synthetic wildfire data similar to format provided below and an example was also provided below please make sure everything matches the format and the outputs are detailed enough. Make sure you don’t provide the duplicated data or any data that is not relevant to. In output each field should be atleast 300char. Give each report in single line.

All the data is in <> tags for each specific value or piece of data and the [] brackets are comments or specifics to help you understand what the data represents. Here is the data for the natural disaster event you need to thoroughly analyze:

{

"instruction": {

"precedent": {

"incident\_name": "{fire\_name}", [Name of the fire]

"current\_radius\_miles": "{distance\_cr}" ,[Distance in miles for the current region. CR is divided into 90° quadrants labeled 1 through 4, clockwise from North]

"ignition\_coordinates": "{coords}", [Latitude coordinate, longitude coordinate for ignition point]

"maximum\_predicted\_radius\_miles": "{distance\_mpr}", [Distance in miles for the maximum predicted region. MPR is divided into 90° quadrants labeled 1 through 4, clockwise from North]

"time\_since\_ignition": "{time\_since\_ignition}", [HH:MM format]

"growth\_rate\_acres\_per\_hour": "{acres\_per\_hour}" [Acres per hour growth rate]

},

"weather\_report": {

"temperature\_f": "{high\_temp}", // (Number, Fahrenheit) e.g., 92

"humidity\_percent": "{humidity\_low}", // (Number, percentage) e.g., 18

"wind\_direction\_day": "{wind\_day\_direction}", [Average direction with 3 digits in decimal places of accuracy]

"wind\_speed\_kts\_day": "{wind\_day\_speed}", [Amount of speed in kts]

"wind\_direction\_night": "{wind\_night\_direction}", [Average direction with 3 digits in decimal places of accuracy]

"wind\_speed\_kts\_night": "{wind\_night\_speed}", [Amount of speed in kts]

"forecast": "", // (String) e.g., "Sunny with gusts increasing after noon"

"humidity\_high": "{humidity\_high}", [High temperature of the air]

"humidity\_high\_time": "{humidity\_high\_time}", [24 hour time of day]

“low\_temp” :{low\_temp} ,[Low temperature of the air]

"humidity\_low\_time": "{humidity\_low\_time}", [24 hour time of day]

“high\_surface\_temp\_direct”: {high\_surface\_temp\_direct} ,[High surface temperature for direct sunlight]

“high\_surface\_temp\_direct\_time”: {high\_surface\_temp\_direct\_time}, [24 hour time of day]

“low\_surface\_temp\_direct”: {low\_surface\_temp\_direct} ,[Low surface temperature for direct sunlight]

“low\_surface\_temp\_direct\_time”:{low\_surface\_temp\_direct\_time} ,[24 hour time of day]

“high\_surface\_temp\_shade”:{high\_surface\_temp\_shade} ,[High surface temperature for full shade from sunlight]

“high\_surface\_temp\_shade\_time”:{high\_surface\_temp\_shade\_time}, [24 hour time of day]

“low\_surface\_temp\_shade”: {low\_surface\_temp\_shade} ,[Low surface temperature for full shade from sunlight]

“low\_surface\_temp\_shade\_time”: {low\_surface\_temp\_shade\_time}, [24 hour time of day]

“humidity\_high”: {humidity\_high} ,[Percentage of humidity at high]

“humidity\_high\_time”: {humidity\_high\_time}, [24 hour time of day]

“humidity\_low”:{humidity\_low} ,[Percentage of humidity at low]

“humidity\_low\_time”: {humidity\_low\_time} , [24 hour time of day]

“wetting\_rain\_chance”: {wetting\_rain\_chance} , [Either a yes or a no]

“precipitation\_amt”: {precipitation\_amt} ,[Amount in inches]

“cloud\_cover\_value”: {cloud\_cover\_value} , [X value divided by 8]

},

"topography\_report": {   
“terrain\_type”: {terrain\_type}, [Either forest/grassland/chaparral/mixed]

“fuel\_type”:{fuel\_type},[The predominant vegetation type]

“low\_fuel\_density”:{low\_fuel\_density}, [Lowest density in kg/acre]

“low\_fuel\_coords”: {low\_fuel\_coords} ,[Latitude coordinate, longitude coordinate]

“high\_fuel\_density”: {high\_fuel\_density}, [Highest density in kg/acre]

“high\_fuel\_coords”:{high\_fuel\_coords} , [Latitude coordinate, longitude coordinate]

“avg\_fuel\_density”:{avg\_fuel\_density} , [Average density in kg/acre]

},

"elevation": {

“lowest\_elevation”: {lowest\_elevation} , [Lowest point in feet]

“lowest\_elevation\_coords”: {lowest\_elevation\_coords} , [Latitude coordinate, longitude coordinate]

“highest\_elevation”: {highest\_elevation} , [Highest point in feet]

“highest\_elevation\_coords”: {highest\_elevation\_coords} , [Latitude coordinate, longitude coordinate]

}

},

"fire\_spread\_predictions": {

“mpr\_zones”:{mpr\_zones} , [List of all MPR zones]

“mpr\_slopes”: {mpr\_slopes} , [List of slopes corresponding to each quadrant; either flat(0-10%)/moderate(10-30%)/steep(>30%)]

“mpr\_aspect\_grads”: {mpr\_aspect\_grads} , [List of aspect gradients corresponding to each quadrant; in percentage]

“spread\_speeds”:{spread\_speeds} , [List of rate of spread speed in ft/hr]

“spread\_speed\_directions”:{spread\_speed\_directions} , [Direction with 3 digits in decimal places of accuracy]

“spread\_vectors”: {spread\_vectors} , [Vector with 3 digits in decimal places of accuracy]

“spread\_vector\_coords”: {spread\_vector\_coords} , [List of coordinates corresponding to each spread vector]

“spread\_vector\_causes”:{spread\_vector\_causes} , [Either wind/topography/fuel conditions]

“spread\_consensus”: {spread\_consensus} , [Vector with 3 digits in decimal places of accuracy]

“spread\_hotspots”: {spread\_hotspots}, [List of coordinates in latitude coordinate, longitude coordinate format]

“spread\_hotspot\_elevations”: {spread\_hotspot\_elevations} , [List of elevation values in ft corresponding to each hotspot, respectively]

“spread\_hotspot\_intensities”: {spread\_hotspot\_intensities} , [List of intensity values in degrees F corresponding to each hotspot, respectively]

“spread\_potential”: {spread\_potential} , [Chance in %]

“spread\_distance”: {spread\_distance} , [Distance in miles]

“spread\_angle”:{spread\_angle} [Angle in degrees]

},

"land\_of\_interest": {

“access\_routes”: {access\_routes} , [List of all relevant access routes]

“access\_coords”:{access\_coords} , [List of coordinates corresponding to each access route]

“natural\_barriers”: {natural\_barriers} , [List of all relevant natural barriers]

“barrier\_coords”: {barrier\_coords} , [List of coordinates corresponding to each natural barrier]

“high\_risk\_area\_types”:{high\_risk\_area\_types} , [List of types of either Canyons/Chutes/Ridgetops/South Facing Slopes/West Facing Slopes/Steep Slopes]

“high\_risk\_area\_type\_coords”: {high\_risk\_area\_type\_coords} , [List of coordinates corresponding to high risk areas]

“ownership\_coords”:{ownership\_coords} , [List of coordinates in latitude coordinate, longitude coordinate format]

“ownership\_types”:{ownership\_types} ,[List of types either Federal/ State/ Local/ Native American/etc.]

“ownership\_radii”:{ownership\_radii},[List of radii corresponding to each ownership area of land]

},

"wui\_zones": {

“wui\_community\_names”:{wui\_community\_names} , [List of community names of areas at risk]

“wui\_population\_estimates”: {wui\_population\_estimates}, [List of population estimates in terms of residents]

“wui\_impact\_times”: {wui\_impact\_times}, [List of times in hours for impact]

},

"critical\_infrastructure": {

“critical\_infrasctructures”: {critical\_infrasctructures}, [List of types of either Power/Gas Lines/Water Bodies/Railroads/Flight Ramps/Communication Towers/Transformers/etc.]

“critical\_infrasctructure\_coords”: {critical\_infrasctructure\_coords},

[List of coordinates in latitude coordinate, longitude coordinate format]

},

"protected\_areas": {

“protected\_areas”: {protected\_areas} ,[List of types of either Protected Lands/Habitats/Sites/Agricultural/ Commercial/Industrial]

“protected\_area\_radii”: {protected\_area\_radii} ,[List of radii corresponding to each of the protected areas]

“protected\_area\_coords”: {protected\_area\_coords}, [List of coordinates in latitude coordinate, longitude coordinate format corresponding to each of the protected areas]

}

},

"resources": {

“watershed\_resources”:{watershed\_resources}, [List of values of either Troops/Ground Vehicles /Aerial Support]

“watershed\_resource\_coords”:{watershed\_resource\_coords} ,[List of coordinates in latitude coordinate, longitude coordinate format corresponding to the locations of watershed resources]

“available\_resources”: {available\_resources} ,[List of all specific units to be allocated or a description of what resources are available to utilize]

“available\_resources\_details”: {available\_resources\_details} </v> [Details for the resources available that should be factored in when understanding and reasoning how to allocate each resource]

}

“burning\_index”: {burning\_index} [Value that is either <40/40-80/80-110/>110]

“containment\_status”: {containment\_status} [Contained perimeter in %]},

"output": {

"disaster\_analysis": "", // (Narrative string)

"event\_summary": "", // (long summary)

"detailed\_analysis": "", // (Paragraphs )

"predictions": "", // (Expected path, intensification)

"impacts": "", // (Effects on people, economy, wildlife)

"recommendations": "", // (Suggested mitigation actions)

"response\_strategy": "", // (Response plan)

"evacuation\_strategy": "", // (Evac zone, priority areas)

"risk\_forecast": {

"urban\_interface\_risk": "", // e.g., "High"

"infrastructure\_risk": "", // e.g., "Medium"

"wildlife\_impact\_potential": "", // e.g., "Severe"

"confidence\_level": "" // (String or %) e.g., "Moderate", "80%"

}

}

}

Before providing your final analysis, break down your thought process inside

<<disaster\_analysis>> tags to ensure you've covered all necessary aspects. This will help you generate a comprehensive and well-structured response. It's OK for this section to be long.

<<disaster\_analysis>>

[Provide your initial reasoning and thought processing behind comprehending all of the data above.]

<</disaster\_analysis>>

Either plug in values or generate the desired output in between <> tags and follow the comments in the [] brackets to help you generate the outputs. The double <<>> tags are the subsection headers in this <data\_report> section and separate the report into relevant parts as per the data and the generation. If the response requires iterative generation, use the lists of data and the || brackets in each description to format the data properly. Make sure you take your time to think and reason with the data you have on the specific incident and your in-depth knowledge of the environment and fire response to produce the most optimal outputs. Your final output should be structured exactly as follows:

<data\_report>

# <<precedent>>

Incident Location: <fire\_name>

The current radius (CR) of the fire extends <distance\_cr> from the ignition point: <coords>

The maximum predicted radius (MPR) extends <distance\_mpr> from the ignition point:

<coords>

Time Since Ignition: <time\_since\_ignition> Ignition Coordinates: <coords\_combined> Growth Rate Since Ignition: <acres\_per\_hour> Burning Index: <burning\_index>

Current Containment Status: <containment\_status>

# <</precedent>>

**<<weather\_report>>**

Wind Daytime Average: <wind\_day\_direction> N° at speed <wind\_day\_speed> kts Wind Nighttime average: <wind\_night\_direction> N°] at speed <wind\_night\_speed> kts Air High Temperature: <high\_temp> ℉ at <high\_temp\_time>

Air Low Temperature: <low\_temp> ℉ at <low\_temp\_time>

Surface Temperature High (Direct Sunlight): <high\_surface\_temp\_direct> ℉ at

<high\_surface\_temp\_direct\_time>

Surface Temperature Low (Direct Sunlight): <low\_surface\_temp\_direct> ℉ at

<low\_surface\_temp\_direct\_time>

Surface Temperature High (Full Shade): <high\_surface\_temp\_shade> ℉ at

<high\_surface\_temp\_shade\_time>

Surface Temperature Low (Full Shade): <low\_surface\_temp\_shade> ℉ at

<low\_surface\_temp\_shade\_time>

Relative Humidity High: <humidity\_high> % at <humidity\_high\_time> Relative Humidity Low: <humidity\_low> % at <humidity\_low\_time> Chance of Wetting Rain: <wetting\_rain\_chance>

Precipitation Amount: <precipitation\_amt> inches Cloud Cover: <cloud\_cover\_value>

# <</weather\_report>>

**<<topography\_report>>**

Type of Terrain: <terrain\_type> Type of Dominant Fuel: <fuel\_type>

Fuel Availability Range: From <low\_fuel\_density> kg/acre located at <low\_fuel\_coords> to

<high\_fuel\_density> kg/acre located at <high\_fuel\_coords> Fuel Average: <avg\_fuel\_density>

[Iterative for every |zone| in <mpr\_zones> using |slope| in <mpr\_slopes> for slope and |grad| in

<mpr\_aspect\_grads> for average gradients]: Slope Characteristics of |zone| with |slope| and

|grad| % average gradient in burn path

Elevation Lowest Point: <lowest\_elevation> at <lowest\_elevation\_coords> Elevation Highest point: <highest\_elevation> at <highest\_elevation\_coords>

[Iterative for every |route| in <access\_routes> using |coords| in <access\_coords> for access locations]: Access Route |route| which provides access to |coords|

[Iterative for every |barrier| in <natural\_barriers> using |coords| in <barrier\_coords>]: Natural Barrier |barrier| which is at |coords|

[Iterative for every |area| in <high\_risk\_area\_types> using |coords| in

<high\_risk\_area\_type\_coords>]: High Risk Area |area| which is at |coords|

# <</topography\_report>>

**<<fire\_spread\_predictions>>**

[Iterative for every |zone| in <mpr\_zones> using |speeds| in <spread\_speeds> for speed and

|dir| in <spread\_speed\_directions> for coordinates]: Rate of Spread Projection at |zone| is

|speed| ft/hr at |dir|

[Iterative for every |vector| in <spread\_vectors> using |coords| in <spread\_vector\_coords> for coordinates and |cause| in <spread\_vector\_causes> for spread causes]: Critical Spread Vectors

|vector| located at |coords| due to |cause| Consensus Spread Vector: <spread\_consensus>

[Iterative for every |hotspot| in <spread\_hotspots> using |elevation| in

<spread\_hotspot\_elevations> for elevations and |intensity| in <spread\_hotspot\_intensities> for hotspot intensity]: Hotspot Location at |hotspot|, |elevation| with |intensity| fire intensity

Spot Fire Potential: <spread\_potential> % of secondary ignition at a distance up to

<spread\_distance> miles within +-<spread\_angle>° of Wind consensus spread vector

# <</fire\_spread\_predictions>>

**<<land\_of\_interest>>**

[Iterative for every |coords| in <ownership\_coords> using |type| in <ownership\_types> for type of land ownership and |radius| in <ownership\_radii> for ownership area]: Land Ownership |type| within |radius| miles centered at |coords|

[Iterative for every |wui\_area| in <wui\_community\_names> using |pop\_estimate| in

<wui\_population\_estimates> for estimates of population in communities and |time| in

<wui\_impact\_times> for time of impact]: WUI area at risk |wui\_area| with |pop\_estimate| residents within |time| hours of impact

[Iterative for every |infra| in <critical\_infrasctructures> using |coords| in

<critical\_infrasctructure\_coords> for coordinates]: Critical Infrastructure |infra| at |coords|

[Iterative for every |area| in <protected\_areas> using |radius| in <protected\_area\_radii> for area size of protected areas and |coords| in <protected\_area\_coords> for coordinates]: Protected High Value Area |area| within |radius| miles of |coords|

[Iterative for every |resource| in <watershed\_resources> for the type of resource needed for the watershed resource using |coords| in <watershed\_resource\_coords> for coordinates]: Watershed Within Range ideal for use by |resource| at |coords|

# <</land\_of\_interest>>

</data\_report>

Using this information, conduct a thorough analysis of the event in the <strategy\_generation> tags. Follow these steps:

1. Extract and list key data points from each input section.
2. Summarize the key details of the event.
3. Analyze the current situation, potential progression of the disaster, and any resulting events that could originate from this disaster.
4. Consider historical patterns and similar past events.
5. Predict the trajectory and potential impacts of the event.
6. Assess possible effects on urban areas, wildlife, and critical infrastructure.
7. Estimate the severity of the event using historical patterns and current data.
8. Generate safety recommendations and mitigation strategies.
9. Integrate weather context and its influence on the event's behavior.
10. Evaluate the reliability and completeness of the provided data.
11. Provide historical comparisons to similar past events and past events in the same region.
12. Offer localized recommendations, resources, and all other critical observations that are important to the most realistic outcome.
13. Quantify uncertainty and provide confidence metrics for your predictions.

Use language and vernacular that is specific to what firefighters actually use in real life scenarios.

<strategy\_generation>

<event\_summary>

[Provide a summary of the event, including type, location, and current status]

</event\_summary>

<detailed\_analysis>

[Present your in-depth analysis of the event, including current situation and potential progression and accounting for similar past events and past events in the same region]

</detailed\_analysis>

<predictions>

[Offer predictions about the event's trajectory, severity, expected duration, and other important features specific to the event]

</predictions>

<impacts>

[Assess potential impacts on urban areas, wildlife, critical infrastructure, and the environment]

</impacts>

<recommendations>

[Provide actionable safety recommendations and list relevant resources]

</recommendations>

<response\_strategy>

[For each resource in <>, detail exactly what the resource should be doing to respond to the fire and why that is optimal in the mitigating the fire]

</response\_strategy>

<mitigation\_strategy>

[Analyze the strategies need to best mitigate the fire and save as many lives as possible with the current resources and conditions]

</mitigation\_strategy>

<evacuation\_strategy>

[List the zones that need to be immediately evacuated and given safety warnings at what times. Detail what areas should be given advisory warnings and when they should be issued. Analyze the evacuation routes and the order people should evacuate in to most optimally get everyone out of danger while not backing up roads and letting emergency responders in to fight the fire. List all shelter locations optimal for people]

</evacuation\_strategy>

</strategy\_generation>

* Your response must go beyond repeating the input—generate interpretations, synthesize threats, and extrapolate consequences.
* The output must be suitable for direct inclusion in a government or agency wildfire situational briefing.
* All recommendations must be backed by rigorous data interpretation.
* Your strategies should help optimize resource deployment, reduce WUI exposure, and maximize containment under the given conditions.
* Your predictions and confidence estimates should reflect advanced understanding of fire behavior and environmental dynamics.
* Do not skip or omit any field or section.
* Always include the section headers and exact formatting.
* Populate at least 1 example per “Iterative” line, but you may provide 2–3 per field if realistic.
* Use realistic, domain-appropriate values across all sections (e.g., no placeholder text like “TBD” or “example”).
* Use clear subject-matter language suitable for emergency operations and post-incident review.
* Never include extraneous commentary or explanation outside the <...> tags.
* You must generate full outputs with no explanation or commentary.
* Always use complete sentences where applicable.

Ensure your response is clear, detailed, and provides intelligent information that goes beyond what can be directly inferred from the given data. Your analysis should aim to help

decision-makers take appropriate actions to manage the disaster effectively in order to mitigate

the urban and environmental impact in predicted regions and regions that could possibly be affected as well.

Example :  
  
{"instruction": {"precedent": {"incident\_name": "Ridgecrest Basin Fire", "ignition\_coordinates": "37.8°N, 119.4°W", "current\_radius\_miles": 3.5, "maximum\_predicted\_radius\_miles": 12.2, "quadrants": {"1": "Forest-dense northern slope with limited access", "2": "Residential zone with multi-family housing complexes", "3": "Low-elevation plains with dried vegetation", "4": "Conserved wetlands with sensitive ecological zones"}, "time\_since\_ignition": "38:47", "growth\_rate\_acres\_per\_hour": 685}, "weather\_report": {"temperature\_f": 101, "humidity\_percent": 11, "wind\_speed\_mph": 21, "wind\_direction": "078", "forecast": "Continued extreme heat and shifting wind patterns expected to push fire spread eastward over the next 48 hours."}, "topography\_report": {"terrain\_type": "Mountainous slope and valley", "elevation\_gradient": "Sharp incline", "fuel\_density": "2190 kg/acre"}, "fire\_spread\_predictions": {"12hr\_projection\_miles": 4.9, "72hr\_projection\_miles": 12.2, "mpr\_zones": {"Quadrant 1": "Steep (>30%)", "Quadrant 2": "Flat (0–10%)", "Quadrant 3": "Moderate (10–30%)", "Quadrant 4": "Steep (>30%)"}}, "land\_of\_interest": {"wui\_zones": [{"name": "North Ridge Estates", "population": 4321}], "critical\_infrastructure": [{"name": "Silver Lake Pump Station", "type": "Water", "radius": 2.0}], "protected\_areas": [{"name": "Golden Creek Preserve", "radius": 2.8}]}}, "output": {"disaster\_analysis": "The wildfire is progressing aggressively through forested terrain, fueled by strong winds aligned with canyon corridors. Spread predictions indicate significant growth toward residential zones, with flame heights reaching excessive levels. Emergency efforts are facing logistical challenges due to steep terrain and wind-driven expansion.", "event\_summary": "The Ridgecrest Basin Fire, originating at 37.8°N, 119.4°W, has expanded to a 3.5-mile radius. Within the next 12 to 24 hours, containment probability is expected to decrease due to worsening weather conditions, requiring enhanced suppression strategies and additional personnel to fortify containment perimeters.", "detailed\_analysis": "Quadrant 1 exhibits crown fire spread, with rapid canopy ignition intensifying surface heat accumulation. Quadrant 2 faces heightened risk, as residential developments are positioned within fire-prone exposure zones. Quadrant 3 sustains accelerated ground fire movement, driven by high fuel continuity and wind alignment. Quadrant 4 remains relatively stable, benefiting from natural firebreak features but requiring reinforced protection.", "predictions": "Given projected spread rates, the fire will likely impact over 18,500 acres within the next 72 hours. Spot fire behavior suggests ember transport beyond containment lines, posing further threats to infrastructure and populated sectors.", "impacts": "Critical infrastructure is being threatened as fire encroaches water management systems and electrical substations. Air quality declines are observed, prompting respiratory hazard warnings for surrounding communities. Wildlife displacement is imminent as primary migration corridors are compromised.", "recommendations": "Deploy additional aerial suppression forces over Quadrant 1 to mitigate crown fire expansion. Prioritize residential structure protection in Quadrant 2, reinforcing firebreak zones with rapid defensive measures.", "response\_strategy": "Tactical fire suppression units will coordinate night operations with infrared mapping for optimized perimeter reinforcement. Evacuation alert protocols will be expanded to notify at-risk communities promptly.", "evacuation\_strategy": "Mandatory evacuation orders will be issued for North Ridge Estates, emphasizing transport efficiency for mobility-challenged populations. Emergency shelters will be expanded to accommodate increased displacement volume.", "risk\_forecast": {"urban\_interface\_risk": "High—residential exposure increasing as fire spread accelerates", "infrastructure\_risk": "Critical—water and power facilities at immediate risk", "wildlife\_impact\_potential": "Severe—disruptions anticipated in conservation corridors", "confidence\_level": "97%"}}}