

# Understanding the 2021 Heat Dome Event in Multnomah County, OR: Causes, Consequences, and Future Risks

**Introduction:** In this tutorial, we will explore the 2021 heat dome event that affected Multnomah County, Oregon, and the broader Pacific Northwest region. We will discuss how the event occurred, the contributing factors, the role of climate change and fossil fuel emissions, the damages sustained by Multnomah County, and the risks of similar events in the future.

## 1. The 2021 Heat Dome Event: An Overview

### a. What is a heat dome?

- A heat dome occurs when a strong high-pressure system traps warm air in the atmosphere, causing it to compress and heat up further.
- The high-pressure system acts as a "lid," preventing hot air from escaping and leading to soaring temperatures.

### b. The Pacific Northwest heat dome event in 2021

- The heat dome event affected the Pacific Northwest, including Multnomah County, during the summer of 2021.
- This event broke temperature records, with some areas experiencing temperatures well above 100°F (38°C).

## 2. Contributing Factors and Causes

### a. High-pressure systems and trapped hot air

- The heat dome event resulted from a particularly strong and persistent high-pressure system.
- This high-pressure system trapped hot air, leading to the extreme temperatures experienced during the event.

### b. Climate change and its role in intensifying heatwaves

- Human-induced climate change has led to increased average global temperatures.
- Climate change increases the likelihood and severity of extreme weather events, including heatwaves like the 2021 heat dome event.

## 3. The Oil Industry and Fossil Fuel Emissions

### a. Greenhouse gas emissions and their link to climate change

- Greenhouse gases, such as carbon dioxide and methane, trap heat in the atmosphere, leading to global warming.

- Fossil fuel combustion is a significant source of greenhouse gas emissions, contributing to climate change.
4. The responsibility of the oil industry in exacerbating climate change
- The oil industry, by extracting and refining fossil fuels, contributes to greenhouse gas emissions.
  - By driving the demand for fossil fuels, the oil industry plays a role in exacerbating climate change and its associated impacts.
5. Damages Sustained by Multnomah County
- a. Loss of life and health concerns
- The heatwave led to numerous heat-related deaths and increased hospitalizations in Multnomah County.
  - High temperatures exacerbated existing medical conditions and strained healthcare systems.
- b. Infrastructure strain and energy demand
- The heatwave strained infrastructure, including roads and public transportation systems, leading to potential repairs and maintenance costs.
  - Increased energy demand due to air conditioning usage put stress on the power grid and may have increased costs for utilities and consumers.
- c. Impact on agriculture and wildlife
- The heatwave likely had negative impacts on agriculture, causing crop damage, reduced yields, and stress on livestock.
  - The extreme temperatures also affected local ecosystems and wildlife populations.
6. Future Risks and Assessment
- a. Increased probability of extreme heat events due to climate change
- As the Earth's climate continues to warm, the probability of heatwaves and extreme heat events will increase.
  - The 2021 heat dome event serves as an example of the risks associated with a changing climate.
- b. Strategies for mitigating risks and adapting to a changing climate
- Implementing policies and practices to reduce greenhouse gas emissions is essential for mitigating the risks of future heatwaves.

- Adapting to a changing climate includes investing in infrastructure resilience, emergency preparedness, and public health measures.

## **Conclusion**

The 2021 heat dome event in Multnomah County was a devastating occurrence that highlighted the links between climate change, fossil fuel emissions, and extreme weather events. The damages sustained by the county serve as a stark reminder of the consequences of our changing climate. By understanding the causes and consequences of such events, we can work to mitigate the risks and adapt to a changing climate to better protect our communities in the future.