Fifth National Climate Assessment, 2023

Presented to the President of the United States and Congress

1. **Current climate changes unprecedented over thousands of years**
    a. Greenhouse gas levels highest than the last 800,000 years
    b. Rate of sea level rise in 20th century was faster than any other century in past 2,000 years
    c. Global temperature has increased faster in past 20 years than previous 2,000 years
    d. Current drought in western US most severe in past 1,200 and has persisted for decades

2. **Risks from extreme events are increasing**
    a. US experiences, on average, a billion dollar weather or climate disaster every three weeks

3. **Climate change exacerbates inequities**
    a. Lower income urban neighborhoods experience higher surface temperatures
    b. Flood losses are projected to increase disproportionately in US Census tracts with high percentages of Black residents

4. **Harmful impacts will increase in the near term, even if greenhouse gas emissions fall substantially (Examples)**
    a. Damage to critical infrastructure
    b. Warming temperature shift costal & marine species and habitats
    c. Extreme heat threatens health
    d. Drought threatens water supplies
    e. Rising temperatures and extreme rainfall damage buildings, homes and business
    f. Fires become hotter and damage forests, homes and buildings

5. **Safe, reliable water supplies are threatened by flooding, drought, and sea level rise**

6. **Disruptions to food systems are expected to increase**
    a. Due to increasing temperatures, changes to precipitation, damage from rain and drought

7. **Homes and property at risk from sea level rise and more intense extreme events**

8. **Infrastructure and services increasingly damaged and disrupted by extreme weather and sea level rise**

https://nca2023.globalchange.gov/#overview-section-2

9. **Climate change exacerbates existing health challenges and creates new ones**
    a. More severe and frequent extreme events
    b. Wider distribution of infectious and vector-borne pathogens
    c. Air quality worsened by smog, wildfire smoke, dust and pollen
    d. Food and water insecurity
    e. Mental and spiritual health stressors

10. **Ecosystems undergoing transformational changes°**
    a. Harm to ecosystems
    b. Degradation and extinction of local flora and fauna
    c. Harmful algal blooms and expanding invasive species

11. **Climate change slows economic growth, while climate action presents opportunities**
    a. International impacts can disrupt trade, increase costs on global supply chains
    b. States, cities, municipalities confront climate-driven pressures on budgets
    c. Consumers face high costs for goods and services

12. **Job opportunities shifting due to climate change and climate action**
    a. Employment gains in electrification & renewable energy industries project to outpace job losses in fossil fuel industries

13. **Societal choices drive greenhouse gas emissions**

14. **Rising global emissions are driving global warming, with faster warming in the US**
    a. 2°F warming over industrial era, with about three-quarters (1.7° F) since 1970.
    b. At higher global warming levels, US will experience more severed climate impacts

The Goal must be net zero emissions! How?

- **Decarbonizing** the electricity sector, primarily through expansion of wind and solar energy, supported by energy storage
- Transitioning to transportation and heating systems that use **zero-carbon electricity or low-carbon fuels, such as hydrogen**
- **Improving energy efficiency** in buildings, appliances, and light- and heavy-duty vehicles and other transportation modes
- Implementing **urban planning and building design that reduces energy demands** through more public transportation and active transportation and lower cooling demands for buildings
- **Increasing the efficiency and sustainability of food** production, distribution, and consumption
- **Improving land management to decrease greenhouse gas emissions and increase carbon removal and storage,** with options ranging from afforestation, reforestation, and restoring coastal ecosystems to industrial processes that directly capture and store carbon from the air