

OREGON ENVIROTHON 2023
CURRENT ISSUE: ADAPTING TO A
CHANGING CLIMATE

TEAM # _____

Test Total: _____ / 50 points

Part I: Factors Contributing to a Changing Climate

1. What's the difference between weather and climate? Define the two terms to explain the difference. [2 points]
 - a. Weather is:

 - b. Climate is:

2. Define climate change and identify the main reason it is occurring. [2 points]
 - a. Climate change is:

 - b. The main reason it is occurring is:

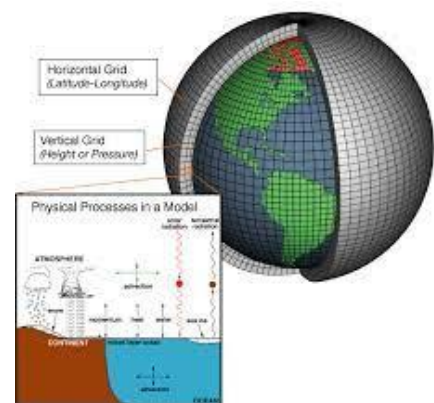
3. Non-renewable energy use is a leading cause of global greenhouse gas emissions. List two energy resources that are renewable. [2 points]
 - a.

 - b.

Part II: Measuring and Monitoring a Changing Climate

4. Models are used to forecast climate, but these models always have some level of uncertainty. Circle the variable that is a common source of uncertainty in projecting future climate. [1 point]

- a. How accurately the models show past weather.
- b. How well models predict the high and low temperatures for the current week.
- c. The amount of CO₂ that human activities will produce in the future.



_____ / 7 points

5. Name two weather pattern changes that climate models predict for the Pacific Northwest and Oregon. [2 points]
- a.
 - b.

Part III: Risks and Impacts to Natural Resources and Society

Use the following information to answer Questions 6–8.

Models show that the changing climate would affect the Pacific Ocean by increasing water temperature, lowering water oxygen levels, lowering water pH (making it more acidic), raising sea level, and changing the strength and action of tides (causing so-called “king tides”).

6. What is a possible biological impact of these changes on marine life? Choose the best response. [1 point]
- a. They may affect what species can live where.
 - b. They may affect many animals’ ability to make shells or skeletons.
 - c. They may affect the amount of food and oxygen available to fish and other marine life.
 - d. All the above.
7. What are two management adaptations the fisheries industry could make to help prepare for these impacts? [2 points]
- a.
 - b.
8. The oceans and their coastlines can be part of the climate solution because they store carbon and fisheries activities use energy. What is one ocean-based mitigation effort that could help reduce the effects of climate change? [2 points]

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Use the following information to answer Questions 9–10.

A changing climate impacts forests in a number of ways. Higher temperatures, heavier rains and longer periods of drought can increase natural disturbances that threaten forest health, such as insect outbreaks, wildfires, invasive species, storms and erosion. These conditions also affect what trees can grow where, causing a shift in species ranges and forest types.

9. What are two management adaptations a forester could make to help prepare for a changing climate? [2 points]
- a.
 - b.
10. Forests can be part of the climate solution because forests store carbon and forestry activities use energy. What is one forest-based mitigation effort that would help reduce the effects of climate change? [2 points]

Use the following information to answer Questions 11–12.

Climate change affects Oregon agriculture in many ways. Higher temperatures, more rain (except in summer), summer drought, fewer cold and freezing days, and less snowpack mean changes in the growing season and more limited water supplies. These conditions contribute to more pests and weeds, and put stress on crops and livestock.

11. What are two management adaptations a farmer or a rancher could make to prepare for a changing climate? [2 points]
- a.
 - b.
12. Agriculture can be part of the solution because soils store carbon and agriculture activities use energy. What is one agriculture-based mitigation effort that would help reduce the effects of climate change? [2 points]

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Use the following information to answer questions 13–18.

The Oregon Climate Change Research Institute (OCCRI) has published future climate projections for Oregon counties. Figure 1 (below) shows OCCRI’s projected direction and level of confidence in the changes of risk of climate-related hazards for Coos County. The OCCRI’s projections are based on evidence from peer-reviewed scientific studies.

Parts of Coos County are shown in the map in Figure 2 (on page 5). As the map shows, the towns of North Bend, Coos Bay, and Charleston are all close to the ocean and at the mouths of rivers and sloughs. In this county, towns are surrounded by forestland. There is also a robust fishing industry and some agriculture.

Figure 1. Projected Direction and Level of Confidence in Changes of Risk of Climate-related Hazards for Coos County.

	Low Confidence	Medium Confidence	High Confidence	Very High Confidence
Risk Increasing 	 Reduced Air Quality  Loss of Wetlands	 Drought  Expansion of Pests, Pathogens, and Non-native Invasive Species	 Heavy Rains  Flooding  Wildfire  Changes in Ocean Temperature and Chemistry  Coastal Hazards	 Heat Waves
Risk Unchanging =	 Windstorms			
Risk Decreasing 				 Cold Waves

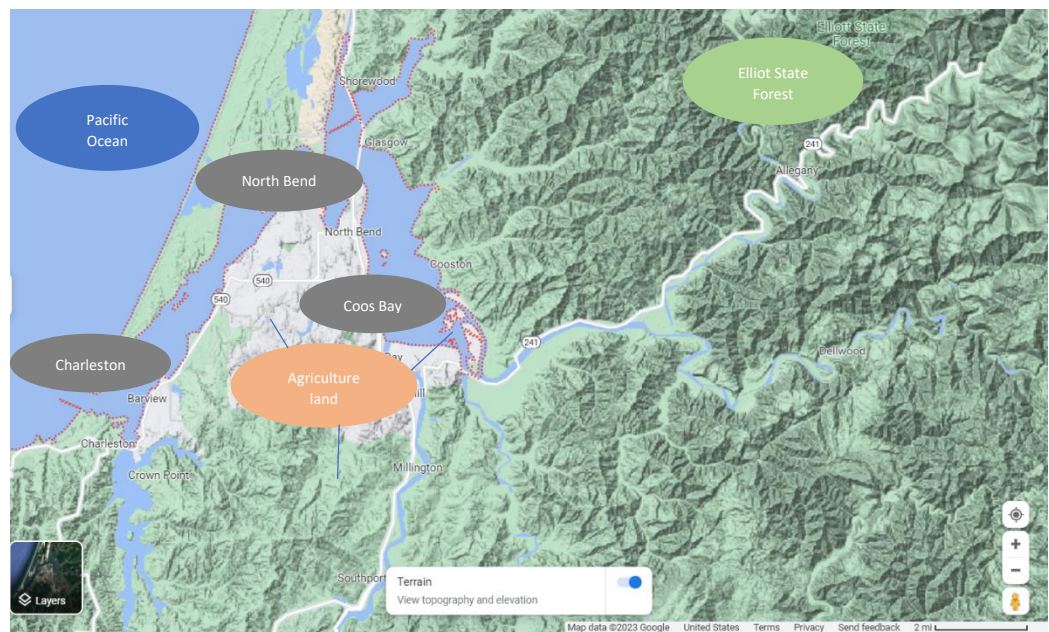
Very High Confidence means that the direction of change is consistent among nearly all global climate models and there is robust evidence in the peer-reviewed literature.

High Confidence means that the direction of change is consistent among more than half of models and there is moderate to robust evidence in the peer reviewed literature.

Medium Confidence means that the direction of change is consistent among more than half of models and there is moderate evidence in the peer-reviewed literature and.

Low Confidence means that the direction of change is small compared to the range of model responses or there is limited evidence in the peer-reviewed literature.

Figure 2. Partial Map of Coos County.



13. Based on Figure 1, list five ways that Coos County will likely be impacted by a changing climate.

- a.
- b.
- c.
- d.
- e.

____/ 5 points

14. Use the information in Figures 1 and 2 to create a climate action plan for this county. [12 points]

Part 1 of the plan: Start your action plan by naming three ways this community and the surrounding natural areas could become more resilient to the predicted changes in climate.

a.

b.

c.

Part 2 of the plan: Finish your action plan by naming three large-scale community mitigation efforts that would help reduce greenhouse gas emissions.

d.

e.

f.

____ / 12 points

15. The Coquille Indian Tribe has tribal lands in Coos County. What is one way climate change may impact the availability of their traditional First Foods that they hunt and gather from the land? [1 point]
16. What are ways the Coquille Indian Tribe could adapt their First Foods practices to prepare for a changing climate? Circle all that apply. [2 points]
- a. Harvest all they can find now before the species have disappeared.
 - b. Monitor and map the changes in species composition over time.
 - c. Adapt management practices and harvest levels as needed to sustain the species.
17. Low-income and disadvantaged communities are particularly challenged by climate change. How might they be affected? Circle all that apply. [2 points]
- a. Climate change will widen social and economic inequities.
 - b. Nothing will change for these communities.
 - c. Climate change will mean a lack of funds to repair, relocate, or replace damage to resources such as parks, recreational facilities, and civic buildings.

Part 4: Policies and Programs for Adapting to a Changing Climate

18. In March 2020, the Oregon governor signed an executive order, called Oregon Climate Action Plan or OCAP. What are OCAP's three big goals? Circle them below. [3 points]
- a. Establishes new state targets to reduce greenhouse gas emissions by at least 45% below 1990 levels by 2035, and by at least 80% by 2050.
 - b. Bans new companies from expanding into Oregon if they produce large amounts of greenhouse gas emissions.
 - c. Requires state agencies to help achieve emissions reduction goals and prioritize climate change and impacted communities in their decision-making.
 - d. Provides specific directives to reduce emissions from our state's largest polluters and protect our most vulnerable communities.

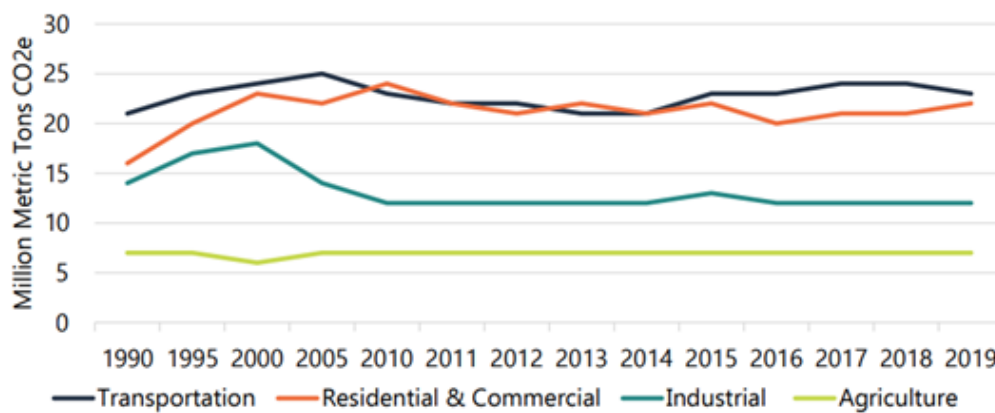


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19. Looking at Figure 3 below, which Oregon sector is the largest contributor to greenhouse gas emissions? [1 point]

- a. Transportation
- b. Residential & Commercial
- c. Industrial
- d. Agriculture

Figure 3. Oregon emissions by sector: 1990-2019 (Source: DEQ, 2020).



20. Based on your answer from Question 19 above, identify two ways an individual could help reduce the amount of greenhouse gas emissions entering the atmosphere. [2 points]

- a.
- b.

____/ 3 points