



Climate change

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Describe how climate change causes severe bleaching events

- Heat stress/increase in temperature disrupts the photosynthesis process in the zooxanthellae and it produces an excess of products that become toxic damages to the metabolism of the coral, expelling the zooxanthalle leaving the coral skeleton a stark bleached white
- Ocean acidity, hard coral cannot absorb the calcium carbonate they need to maintain their skeletons and hence will dissolve

How can climate change affect the spread of diseases

- Alter the distribution of mosquito borne diseases such as malaria and dengue
- Melting of permafrost can release ancient viruses that can cause diseases
- Climate change related disasters such as floods can disrupt the supply chain of medications leading to interruptions in treating

Explain how increase rainfall and temperature can lead to an increase in dengue disease

- Increased temp
 - Increase rate of enzyme catalysed reaction in mosquito vector *Aedes aegypti*
 - Lead to faster development rate and decreased length of reproductive cycles

- Increased in rainfall
 - Lead to more pools of stagnant water
 - Female mosquitos lay eggs in them
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Explain the predicted effect of global warming on the relative fitness of insects in temperate and tropical regions

- Increase in temperature in tropical regions will decrease relative fitness
 - As they have small thermal safety margins due to the environment already close to their physiological optimum, reaching the optimum temperature faster and risk extinction
 - Increase in temperature due to global warming in temperate regions will increase relative fitness of temperate insects
 - As they have larger thermal safety margins as their environments are on average cooler than their physiological optimal, having a broader thermal tolerance
 - Note: difference between an organisms thermal optimum as its current climate temperature is known as the thermal safety margin
 - For insect species, thermal safety margins increases sharply with latitude
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How does human activity contributes to climate change

- increased prouction of CO₂ due to burning of fossil's fuels, increased decomposing materials like landfills and burning land and vegetation to clear for agriculture
- CO₂ is a greenhouse gas which contributes to greenhouse effect
- Heat emitted from earth surface is absorbed and re-emitted by greenhouse gas trapping the heat in atmosphere resulting in global warming