

Quiz - 7: Climate Change: Detection and Attribution

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Started: March 1, 2009 9:08 PM

Questions: 10

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1. Attribution of climatic extremes (Points: 10)

A single extreme event such as Hurricane Katrina or the summer 2003 heat wave in Europe (multiple correct answers)

- a. that occurred in the past will never appear again.
- b. can be predicted precisely as the planet warms further.
- c. can have its probability of occurrence change due to global warming.
- d. cannot be attributed to global warming.

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2. Global temperature change and natural forcings (Points: 10)

Global average temperature in GCMs that use only natural forcings starts to diverge from observed global temperature around the year

- a. 2000
- b. 1980
- c. 1920
- d. It never diverges from the observed value.

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3. Optimal Fingerprinting (Points: 10)

The method of optimal fingerprinting

- a. requires all climatic forcings to cancel, thus optimizing negative feedbacks.
- b. alleges that humans are the culprits in all climate change.
- c. compares patterns of observed climate change with patterns produced by known forcings in GCMs.
- d. maximizes the response of the earth's climate to changes in climatic forcings.

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4. Likelihood of human influence (Points: 10)

The latest IPCC report (AR4) says that most global warming is *extremely* likely due to increase in human-produced greenhouse gas concentrations.

True False

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5. Revealing climate change (Points: 10)

Which one of these processes involves demonstrating that climate has changed, but does not give reasons why it has changed.

- a. Internal climate variability
- b. Detection
- c. Negative feedback
- d. Attribution

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6. Internal variability (Points: 10)

Which one of these is considered a type of internal variability in the climate system?

- a. El Niño
- b. Increased atmospheric carbon dioxide
- c. Volcano eruptions
- d. Solar output changes

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7. Contributions to cooling (Points: 10)

Optimal fingerprinting analyses using different GCMs consistently show that the largest negative (cooling) contribution to global temperature change from the 1900s to the 1990s is

- a. human factors other than increased greenhouse gases.
- b. natural forcing factors.
- c. increased greenhouse gases,

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8. Attribution of climate change (Points: 10)

Attribution of climate change requires that [multiple correct choices. Choose all of them for full credit.]

- a. a forcing is distinguishable from other forcings.
- b. a forcing can have its amplitude scaled.
- c. a forcing (or some combination of forcings) can explain the observed pattern of change.
- d. a combination of forcings sums to zero.

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9. Optimal fingerprinting and noise (Points: 10)

Optimal fingerprinting assumes that all climate change has an identified forcing with no noisiness.

True False

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10. Agreement among GCM simulations (Points: 10)

The spread among GCMs in their simulations of 20th century temperature time series with all known forcings

- a. is greatest before greenhouse-gas effects emerge.
- b. increases as the area of interest gets smaller.
- c. shows that GCMs are unreliable.
- d. decreases as the area of interest gets smaller.

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