



Urban areas rainier from heat and smog

Description

A new study has found that many cities around the world receive more rain than their surrounding areas. This phenomenon, known as the urban rainfall effect, is similar to the urban heat island effect.

Researchers, led by Dev Niyogi from the University of Texas at Austin, analyzed satellite data on rainfall in 1056 cities and nearby rural areas between 2001 and 2020. They discovered that over 60% of cities were "wet islands," experiencing more rainfall than their surroundings. Some cities, like Ho Chi Minh City and Sydney, had more than 100 millimeters of additional rainfall per year compared to their surroundings.

The study also revealed that factors such as heat absorption by buildings, urban roughness, air pollution, and lack of vegetation influence how cities affect rainfall. Larger cities with higher populations were more likely to be wet islands, and cities in temperate, tropical, and coastal regions showed the largest rainfall anomalies.

Interestingly, the difference in rainfall between wet islands and their surroundings has nearly doubled over the study period, attributed to urbanization and climate change. While current weather models do not account for the impact of cities on rainfall, future city planning may consider this information to manage flooding and drought risks effectively.

Understanding the urban rainfall effect can help cities make informed decisions to mitigate extreme weather conditions.

Vocabulary List:

1. **Phenomenon** /fə'nomɪnən/ (noun): An observable event or occurrence.
2. **Absorption** /əb'zɔ:rpʃən/ (noun): The process of taking in or assimilating.
3. **Urbanization** /,ɜ:r.bən.ɪ'zeɪ.ʃən/ (noun): The process by which cities grow and populations increase in urban areas.
4. **Anomalies** /ə'nom.ə.lɪz/ (noun): Deviations from the norm or expected patterns.
5. **Mitigate** /'mɪt.ɪ.geɪt/ (verb): To make something less severe serious or painful.
6. **Roughness** /'rʌf.nəs/ (noun): The quality of being uneven or harsh in texture.

Comprehension Questions



Multiple Choice

1. What is the phenomenon discussed in the text that many cities around the world experience, receiving more rain than their surrounding areas?
 - Option: Urban Heat Island Effect
 - Option: Urban Rainfall Effect
 - Option: Global Warming Effect
 - Option: City Expansion Effect

2. Who led the research on urban rainfall effect as mentioned in the text?
 - Option: Dev Niyogi
 - Option: Jane Smith
 - Option: Michael Johnson
 - Option: Sarah Lee

3. What did the study find about larger cities with higher populations in relation to the urban rainfall effect?
 - Option: They are less likely to be wet islands
 - Option: They have lower rainfall anomalies
 - Option: They are more likely to be wet islands
 - Option: They have no impact on rainfall

4. Which regions showed the largest rainfall anomalies according to the study discussed?
 - Option: Arctic regions
 - Option: Desert regions
 - Option: Temperate, tropical, and coastal regions
 - Option: Mountainous regions

5. What factors were mentioned in the text as influencing how cities affect rainfall?
 - Option: Traffic congestion
 - Option: Lack of public transportation
 - Option: Heat absorption by buildings, urban roughness, air pollution, and lack of vegetation
 - Option: Industrial waste disposal

6. The difference in rainfall between wet islands and their surroundings has nearly doubled over the study period due to which factors?
 - Option: Economic factors
 - Option: Urbanization and climate change
 - Option: Natural disasters
 - Option: Technological advancements



Answer

Multiple Choice: 1. Urban Rainfall Effect 2. Dev Niyogi 3. They are more likely to be wet islands 4. Temperate, tropical, and coastal regions 5. Heat absorption by buildings, urban roughness, air pollution, and lack of vegetation 6. Urbanization and climate change

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. What term describes the variety and differences among people in a community?
Option: A) Unity
Option: B) Harmony
Option: C) Diversity
Option: D) Uniformity
2. Which term refers to the application of scientific knowledge for practical purposes?
Option: A) Innovation
Option: B) Tradition
Option: C) Technology
Option: D) Preservation
3. What is the term for providing assistance or encouragement to someone or something?
Option: A) Opposition
Option: B) Isolation
Option: C) Support
Option: D) Neglect
4. Who is a person not serving in the military or police force?
Option: A) Officer
Option: B) Civilian
Option: C) Enlistee
Option: D) Mercenary
5. Which term means to make something less severe serious or painful?
Option: A) Escalate
Option: B) Worsen
Option: C) Mitigate
Option: D) Intensify



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6. What are inconsistencies or deviations from the norm or common rules called?
- Option: A) Patterns
Option: B) Conformities
Option: C) Regularities
Option: D) Anomalies
7. What term describes the process of returning to a normal state after a period of difficulty?
- Option: A) Decline
Option: B) Progress
Option: C) Recovery
Option: D) Deterioration
8. Which term describes feeling disappointed upset or discouraged because of the inability to achieve a goal?
- Option: A) Satisfied
Option: B) Elated
Option: C) Content
Option: D) Frustrated
9. What term refers to the action or power of focusing one's attention or mental effort?
- Option: A) Scatter
Option: B) Divergence
Option: C) Absorption
Option: D) Concentration
10. What is the invasion and multiplication of microorganisms in body tissues called?
- Option: A) Immunization
Option: B) Infection
Option: C) Vaccination
Option: D) Sterilization

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

11. Efforts to _____ the environment for future generations are crucial.
12. During the emergency all residents were asked to _____ the area immediately.
13. The solar eclipse was a natural _____ that amazed the onlookers.
14. Fever and cough are common _____ of the flu.



15. The police are investigating the _____ of valuable artwork from the museum.
16. Overcoming obstacles can be a daunting _____ but also an opportunity for growth.
17. The hospital used a _____ solution for cleaning wounds.
18. _____ is the process of population shift from rural to urban areas.
19. Understanding the biological _____ behind diseases is crucial for effective treatment.
20. Plants get water and nutrients through the process of _____ from the soil.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. The organization provided assistance and guidance to the struggling families in the community.
22. She took the _____ to organize a charity event to help raise funds for the homeless shelter.
23. The scientific team embarked on an extensive _____ of the uncharted territory in search of new species.
24. Winning the championship was a remarkable _____ for the young athlete.
25. The quick and efficient emergency _____ saved many lives during the natural disaster.
26. The successful project was the result of excellent teamwork and _____ among all members.
27. The company conducted a thorough audit to analyze its budget and expenditures.
28. The historical event had great _____ in shaping the future of the nation.
29. The young artist's _____ of different art styles greatly influenced her unique creations.
30. Due to the approaching hurricane the authorities ordered the residents to _____ the coastal region.

Answer

Multiple Choice: 1. C) Diversity 2. C) Technology 3. C) Support 4. B) Civilian 5. C) Mitigate 6. D) Anomalies 7. C) Recovery 8. D) Frustrated 9. D) Concentration 10. B) Infection

Gap-Fill: 11. sustain 12. evacuate 13. phenomenon 14. symptoms 15. theft 16. challenge 17. saline 18. Urbanization 19. mechanisms 20. absorption

Matching sentence: 1. Support 2. Initiative 3. Exploration 4. Achievement 5. Response 6. Cooperation 7. Financial



8. Significance 9. Exploration 10. Evacuate

CATEGORY

1. Sci/Tech - LEVEL3

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