

Passage III

Cloud cover is the percent of Earth's surface covered by clouds. Cloud cover may increase because of an increase in the cosmic ray flux (number of high-energy particles from space reaching Earth per m² per hour). Table 1 shows how Earth's cover of low clouds (0 km to 3.2 km altitude) varies with the cosmic ray flux. Figures 1–3 show the relative cosmic ray flux, RCRF (the percent below the flux measured on October 1, 1965), and the monthly average cover of high clouds (6.0 km to 16.0 km altitude), middle clouds (3.2 km to 6.0 km altitude), and low clouds, respectively, from January 1980 to January 1995.

Cosmic ray flux (particles/m ² /hr)	Cover of low clouds (%)
340,000	27.8
360,000	28.1
380,000	28.4
400,000	28.7
420,000	29.0

Table 1 adapted from E. Palle Bagó and C. J. Butler, "The Influence of Cosmic Rays on Terrestrial Clouds and Global Warming." ©2000 by Institute of Physics Publications, Ltd.

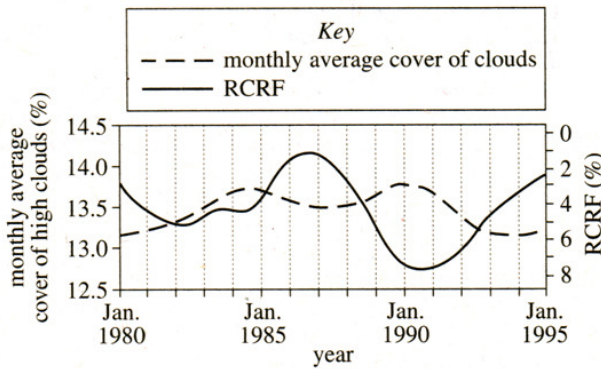


Figure 1

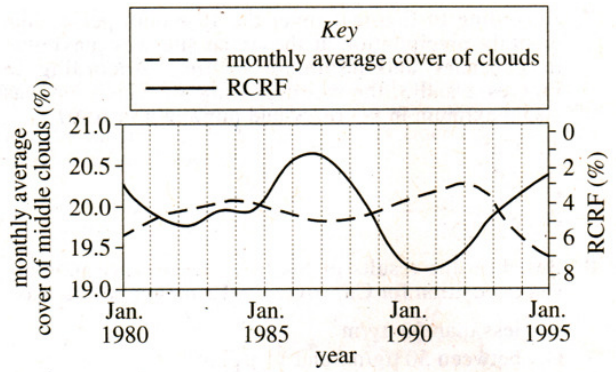


Figure 2

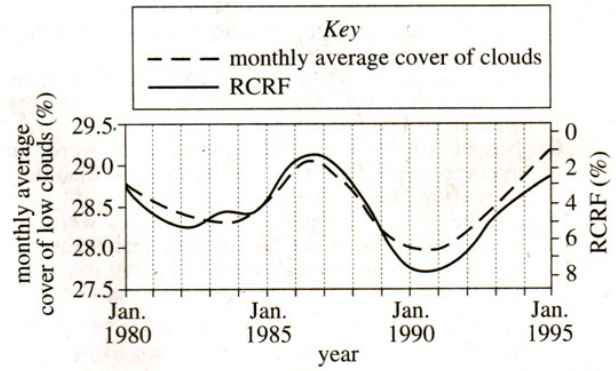


Figure 3

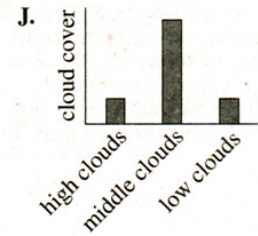
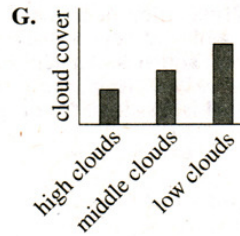
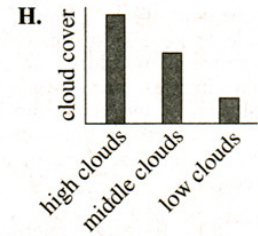
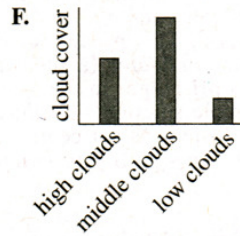
Figures adapted from Nigel Marsh and Henrik Svensmark, "Low Cloud Properties Influenced by Cosmic Rays." ©2000 by The American Physical Society.

13. The percent of Earth's surface covered by high clouds in January 1987 was closest to which of the following?
- A. 13.0%
 - B. 13.5%
 - C. 14.0%
 - D. 14.5%

14. Based on Table 1, a cosmic ray flux of 440,000 particles/m²/hr would correspond to a cover of low clouds that is closest to which of the following?
- F. 28.7%
 - G. 29.0%
 - H. 29.3%
 - J. 29.6%

15. Is the statement "The monthly average cover of low clouds is more directly correlated with cosmic ray flux than is the monthly average cover of high clouds" consistent with Figures 1 and 3 ?
- A. Yes, because the plot for the monthly average cover of low clouds more closely parallels the plot for RCRF.
 - B. Yes, because the plot for the monthly average cover of high clouds more closely parallels the plot for RCRF.
 - C. No, because the plot for the monthly average cover of low clouds more closely parallels the plot for RCRF.
 - D. No, because the plot for the monthly average cover of high clouds more closely parallels the plot for RCRF.

16. Which of the following figures best represents the monthly average cover of high, middle, and low clouds in January 1992 ?



17. High clouds are composed primarily of ice crystals, whereas low clouds are composed primarily of water droplets. This difference is most likely because the average air temperature at altitudes from:
- A. 0 km to 3.2 km is at or below 0°C, whereas the average air temperature at altitudes from 3.2 km to 6.0 km is above 0°C.
 - B. 0 km to 3.2 km is at or below 0°C, whereas the average air temperature at altitudes from 6.0 km to 16.0 km is above 0°C.
 - C. 0 km to 3.2 km is above 0°C, whereas the average air temperature at altitudes from 3.2 km to 6.0 km is at or below 0°C.
 - D. 0 km to 3.2 km is above 0°C, whereas the average air temperature at altitudes from 6.0 km to 16.0 km is at or below 0°C.