NATIONAL BUREAU OF STANDARDS CLIMATIC CHARTS

J. Benson -- 21 October, 1982

For the benefit of those people working on array configuration studies, I have enclosed climatic charts of the continental U.S. Hopefully, this information is not the last word we will have concerning dry sites, but as of today it is the best data we have.

The maps of the radio refractive index were taken from: Climatic Charts and Data of the Radio Refractive Index of the United States and the World, by B. R. Bean, J. D. Horn, and A. M. Ozanich, Jr., National Bureau of Standards Monograph 22; 25 November 1960 (QC100.U556 no. 22). The relevant formulae are:

$$N = (n-1)\ 10^6 = \frac{77.6}{T}\left[P + \frac{4810\ e_S\ RH}{T}\right],$$

where n = radio refractive index,

P = atmospheric pressure (mb),

RH = relative humidity (%),

e_S = saturation vapor pressure (mb),

T = temperature (K).

N is accurate to ∿ 5% up to 30 GHz.

N_s = N calculated from surface weather observations.

The dry and wet atmosphere components of N are:

$$N_{dry} = D = \frac{77.6}{T}\ P, \lesssim 0.6\ N$$

$$N_{wet} = W = \frac{3.73\ 10^5}{T^2}\ e_S\ RH.$$

The surface index N_S is scaled to a sea level index N_o,

$$N_o = (D + W) \exp(0.1057\ h),$$

where h is the site altitude in kilometers.

We have another document in Charlottesville: Atmospheric Humidity Atlas - Northern Hemisphere, by I. I. Gringorten, H. A. Salmela, I. Solomon and J. Sharp, published by the Air Force Cambridge Research Laboratories; AFCRL-66-621, Air Force Surveys in Geophysics, No. 186. This document contains 120 plates showing dew points at the surface and at 850, 700, 500 and 400 mb levels. All plates cover the entire northern hemisphere and the resolution on the continental U.S. is fairly poor. It is based on radiosonde balloon flights and does give us information about water vapor versus altitude. The document is too large and diverse to copy; please check your libraries.

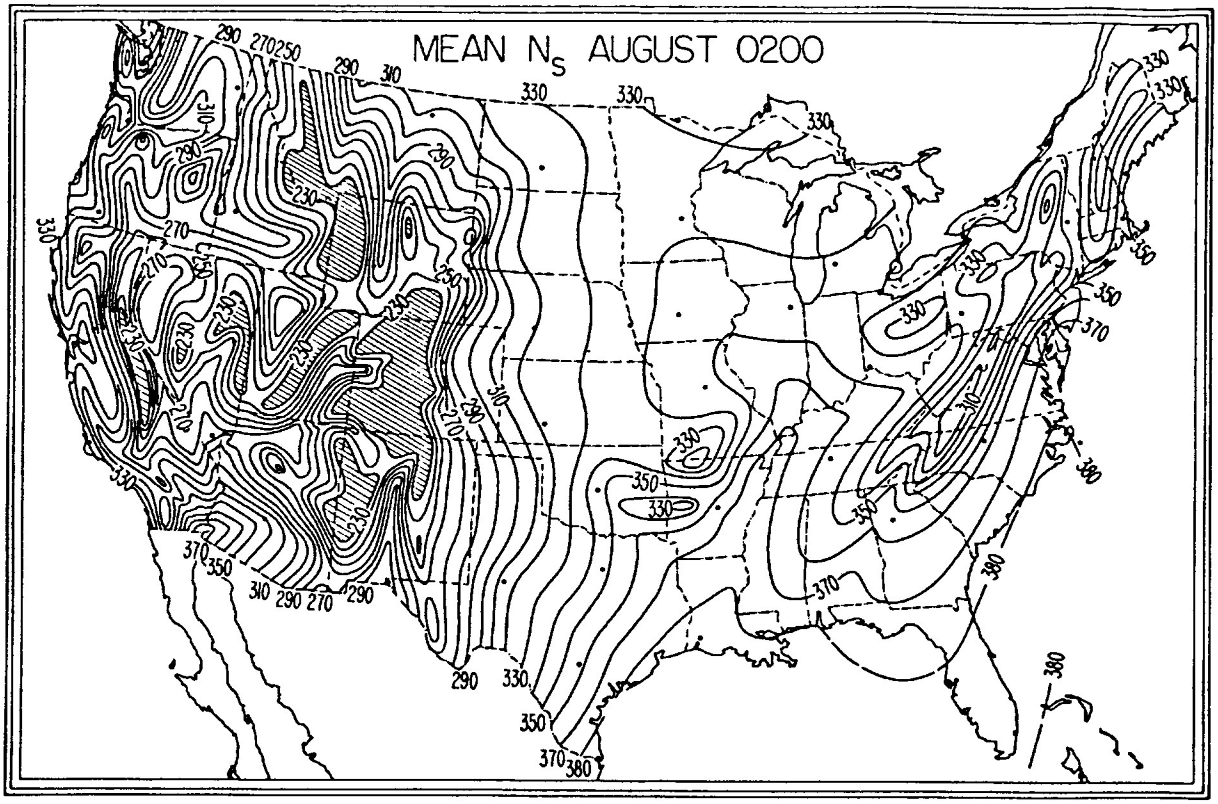

FIGURE 1. *Mean N_s: August 0200 local time.*

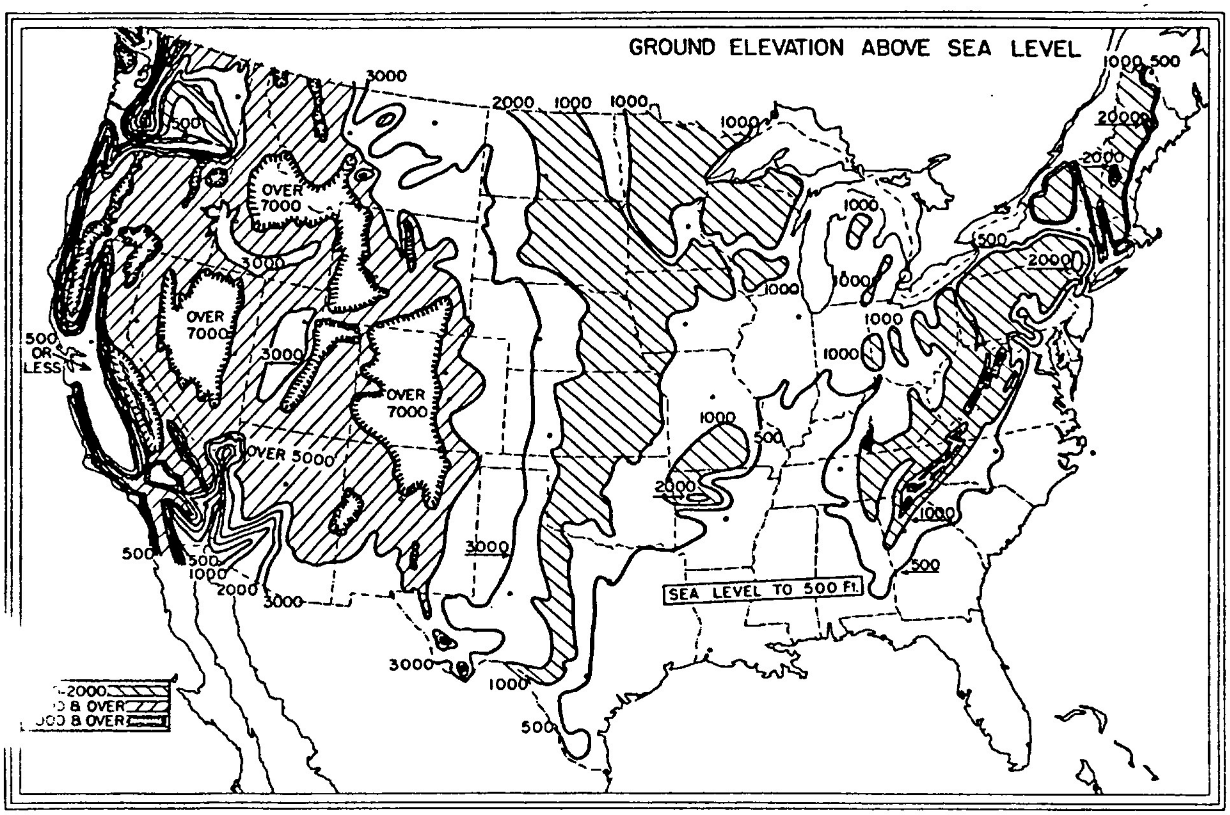

FIGURE 2. *Elevation of ground above sea level.*

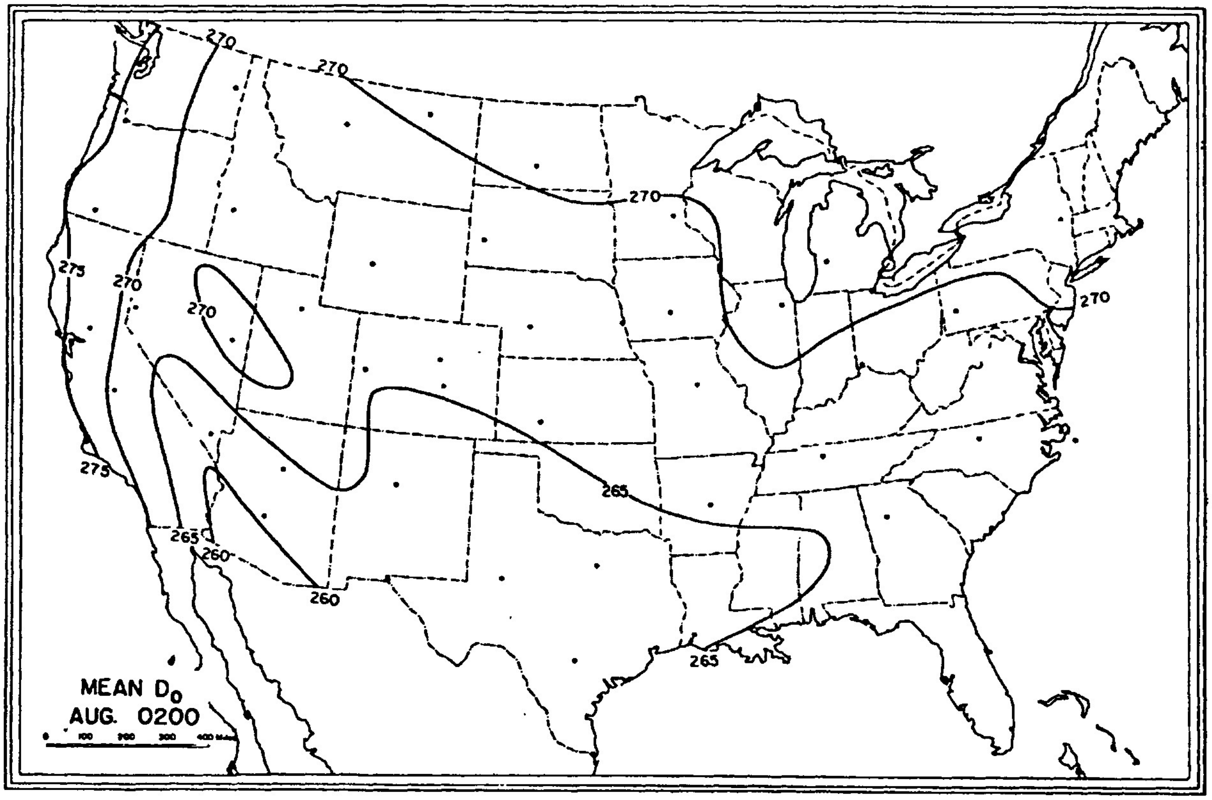

FIGURE 3. *Mean* D_o: *August 0200 local time.*

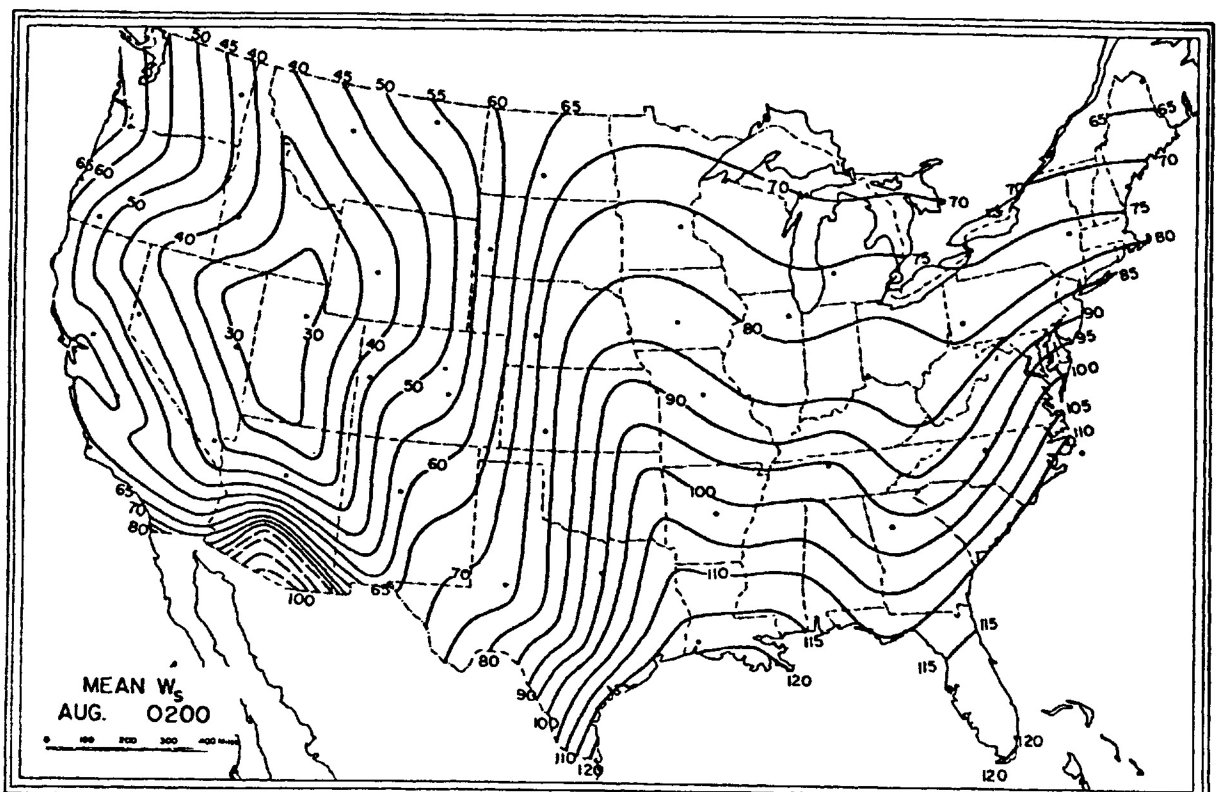

FIGURE 4. *Mean* W_s: *August 0200 local time.*

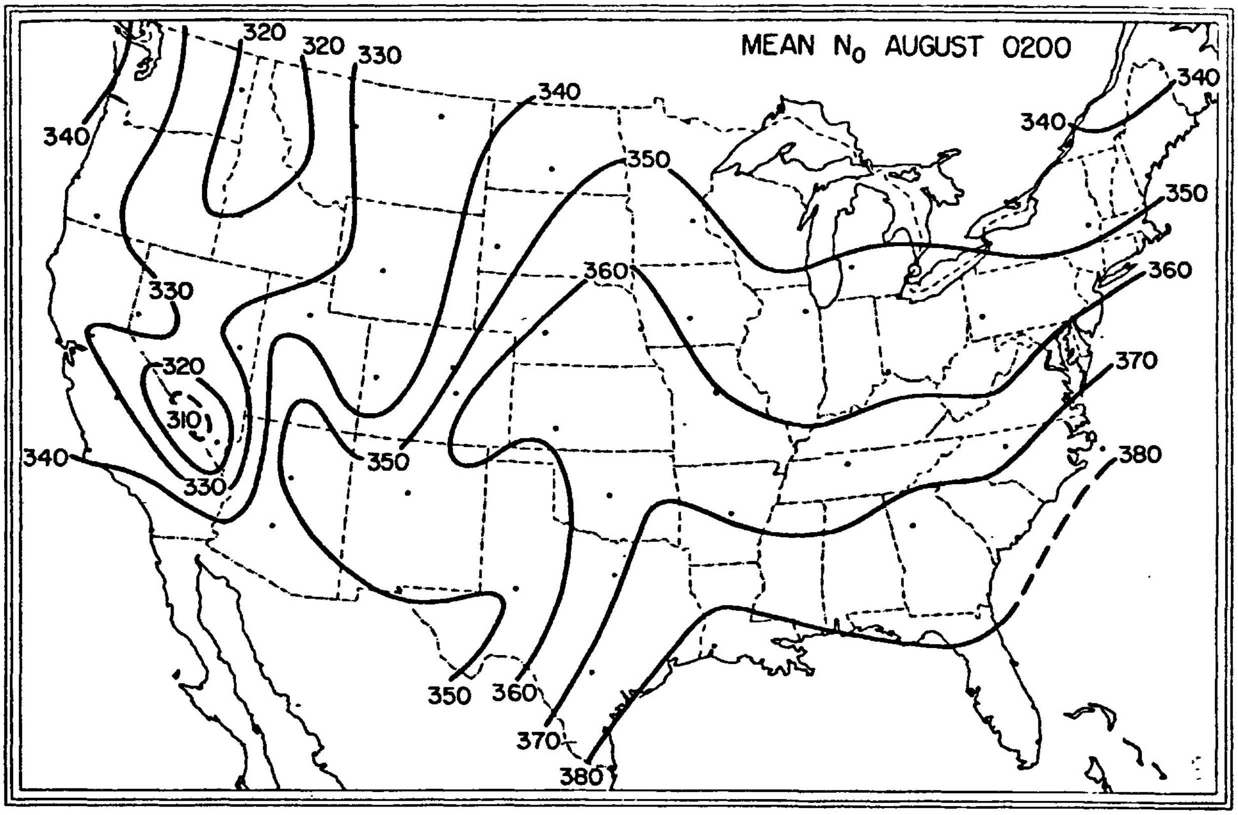

FIGURE 5. *Mean* N_o: *August 0200 local time.*

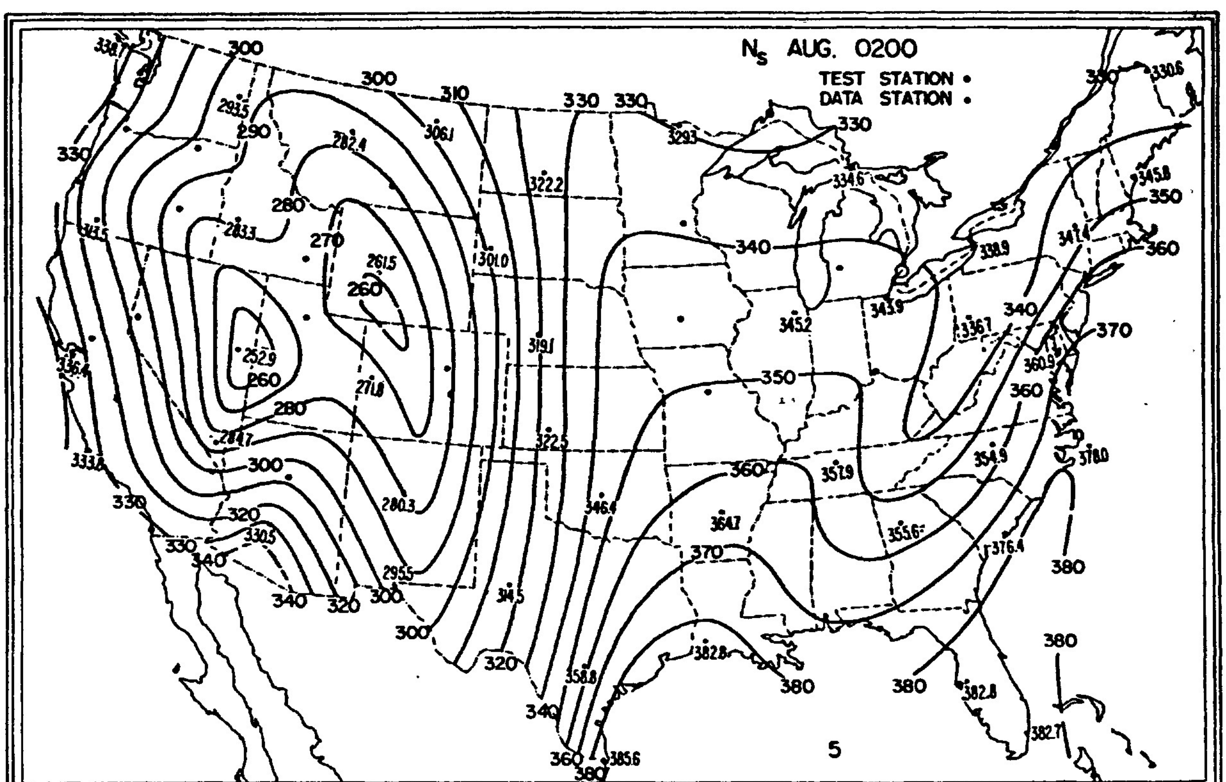

FIGURE 6. *Mean* N_s: *August 0200* (*Test Map*).

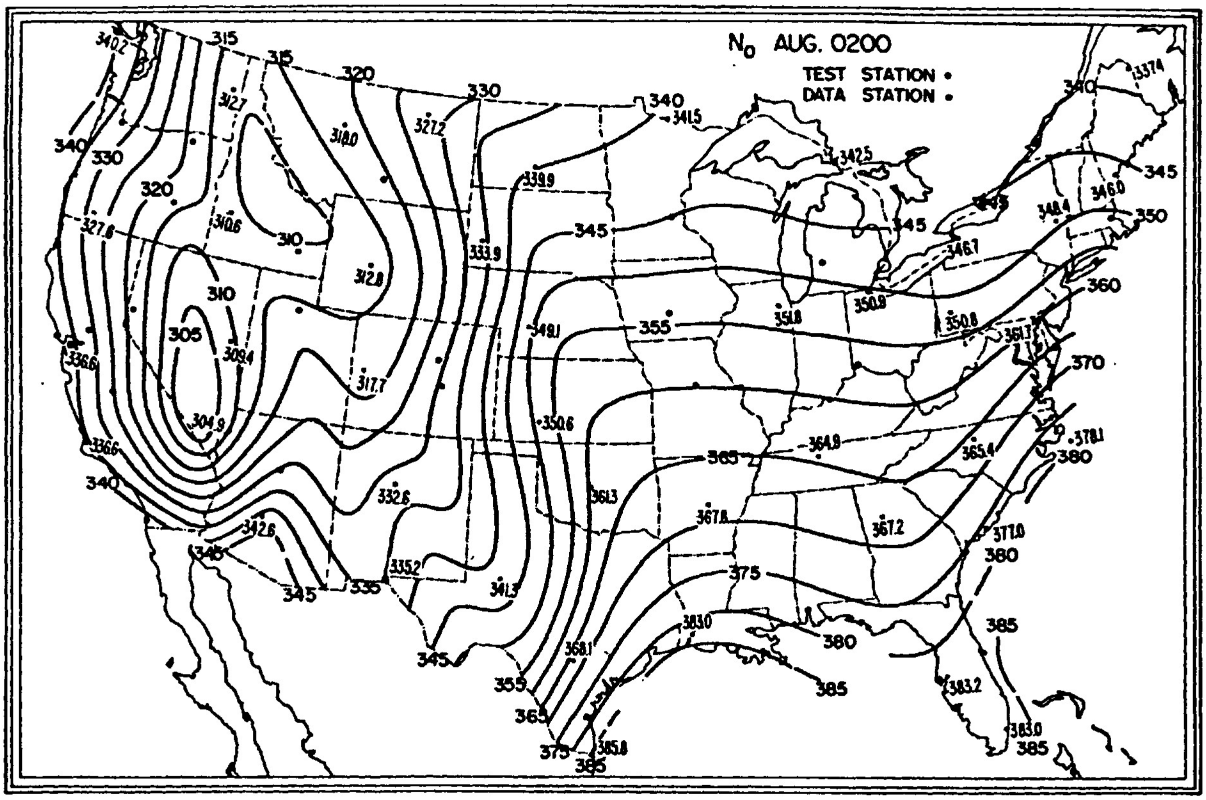

Figure 7. *Mean* N_o: *August 0200 (Test Map).*

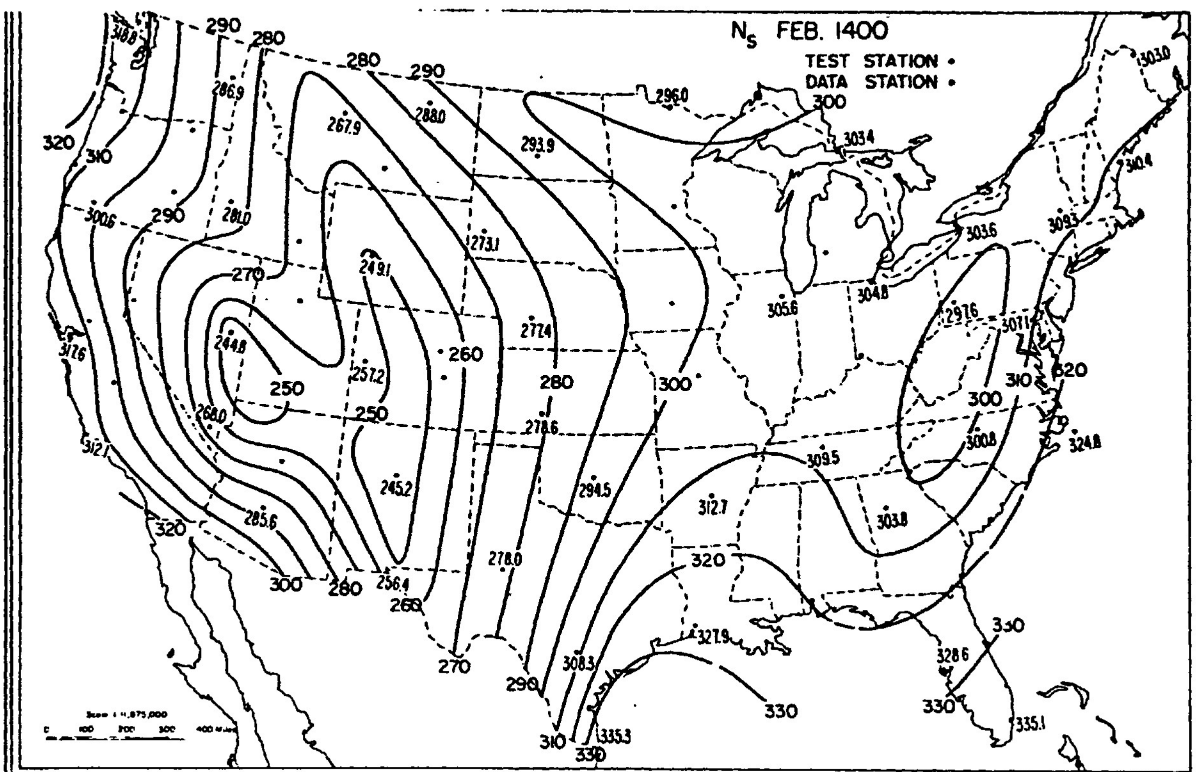

Figure 8. *Mean* N_s: *February 1400 (Test Map).*

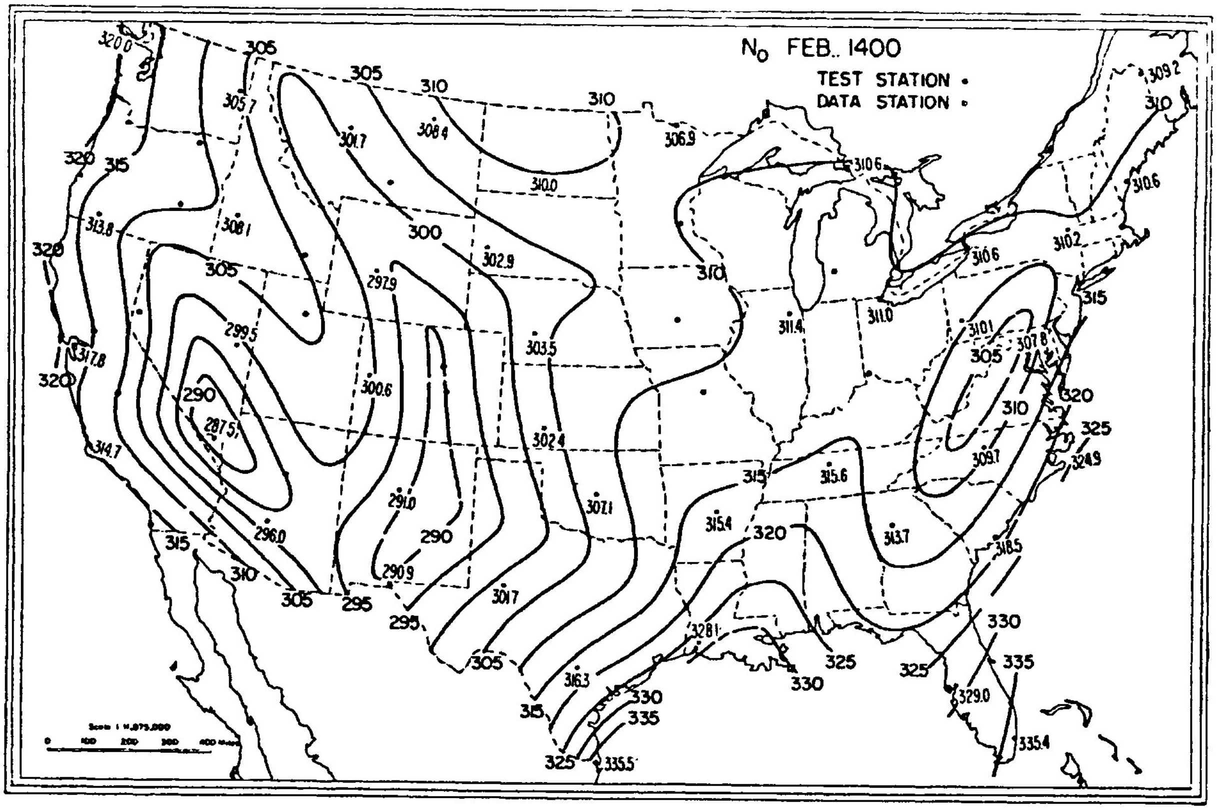

FIGURE 9. *Mean* N_o: *February 1400 (Test Map).*

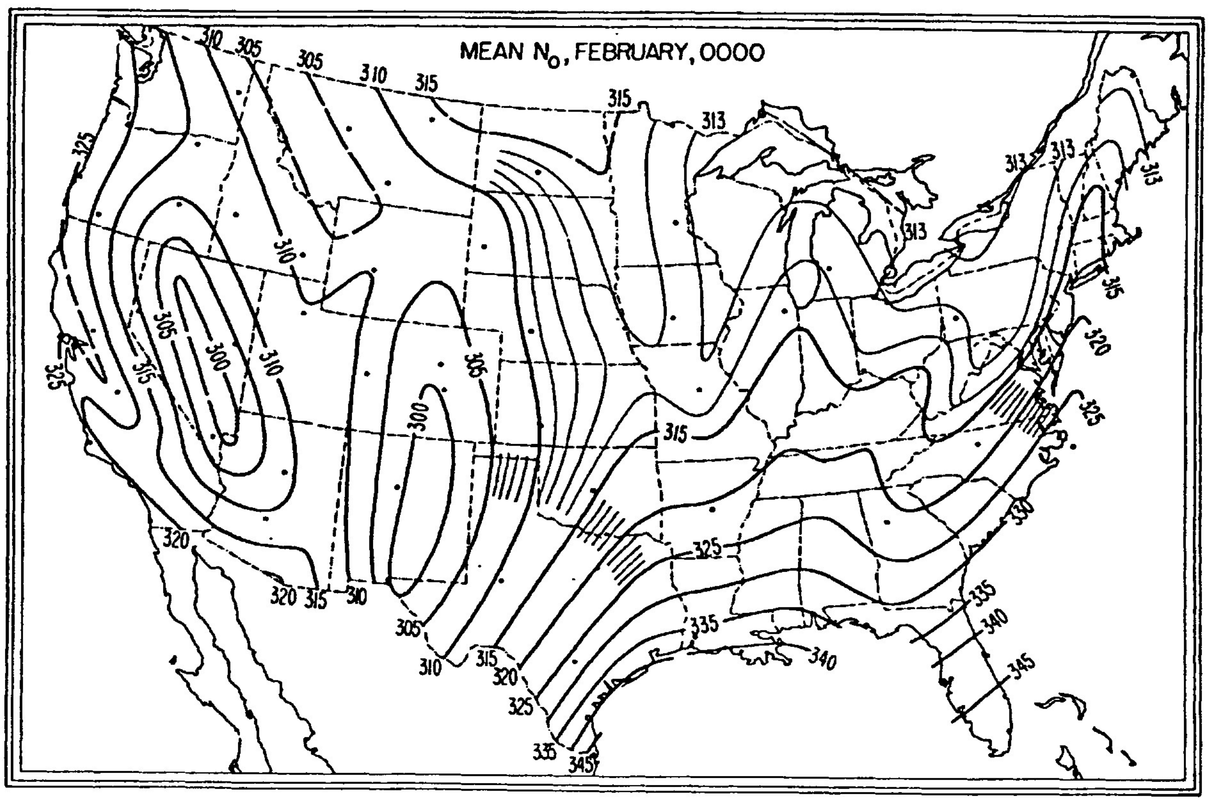

FIGURE 10. $\overline{N}_o$, *February, 0000 local time.*

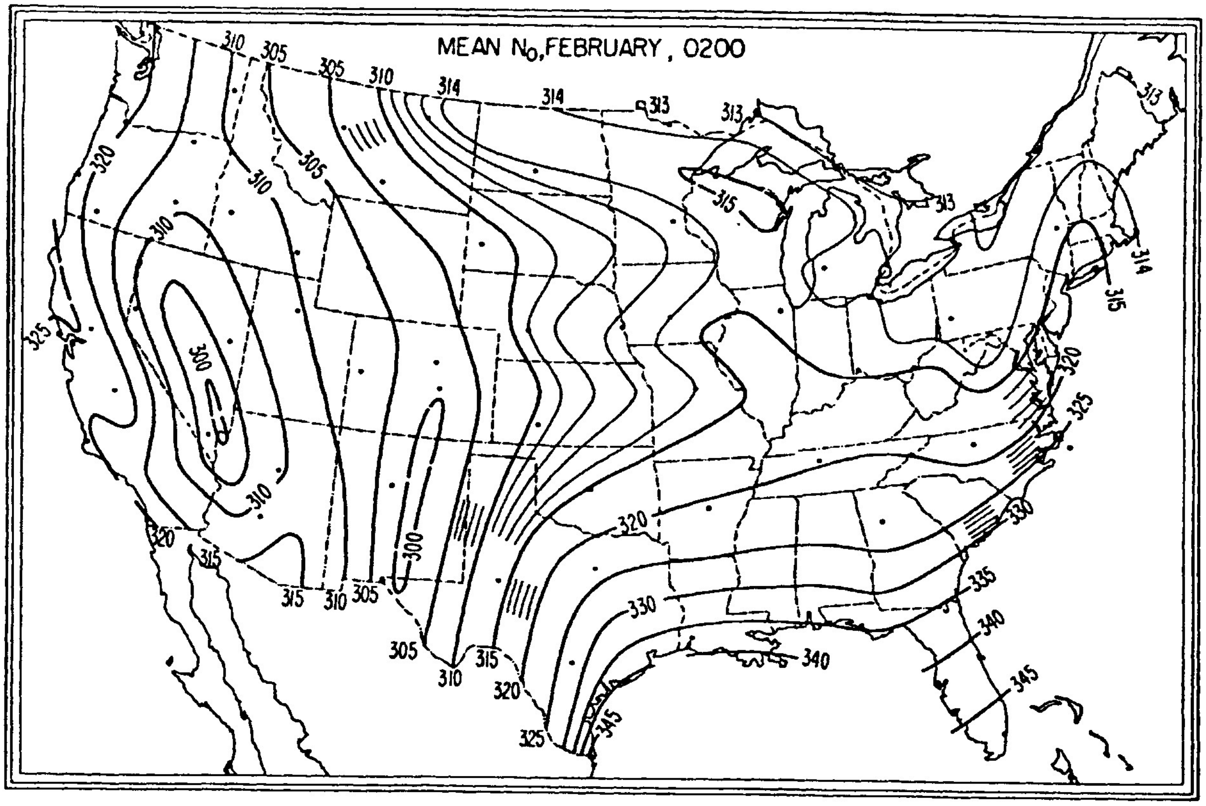

FIGURE 11. $\overline{N}_o$, *February, 0200 local time.*

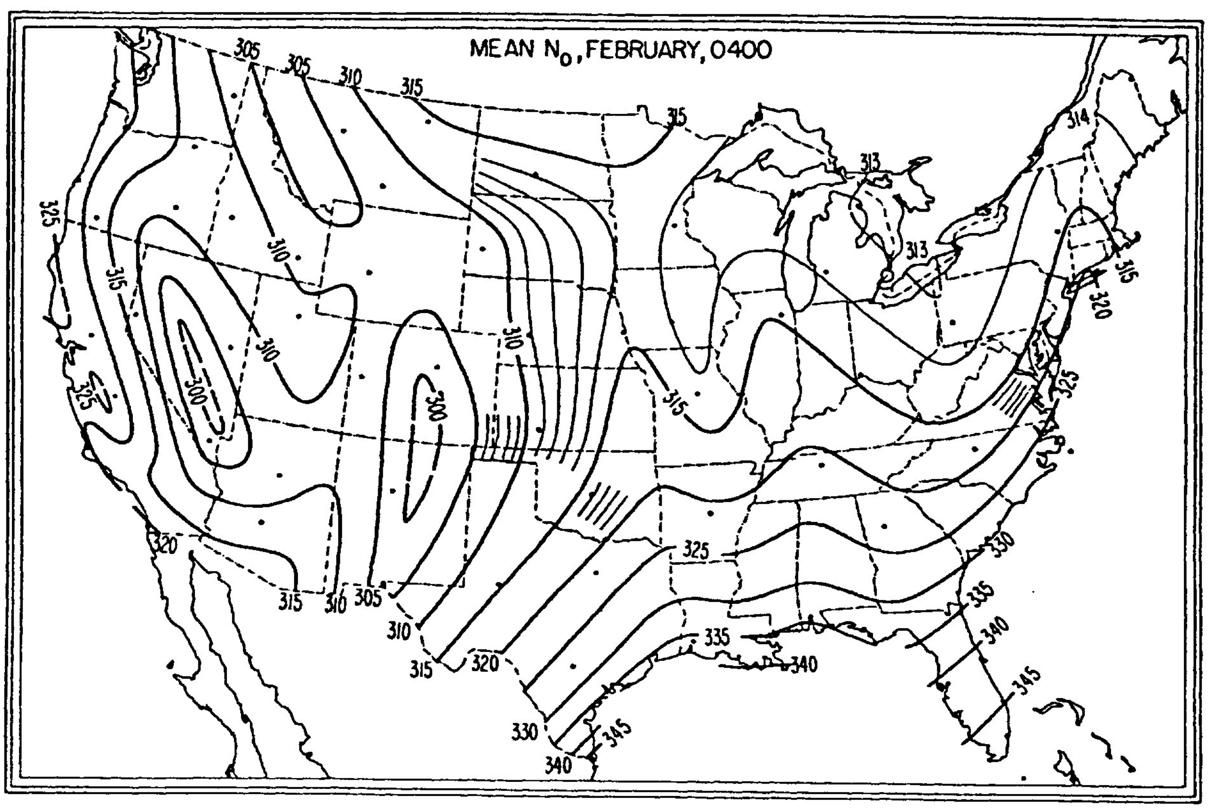

FIGURE 12. $\overline{N}_o$, *February, 0400 local time.*

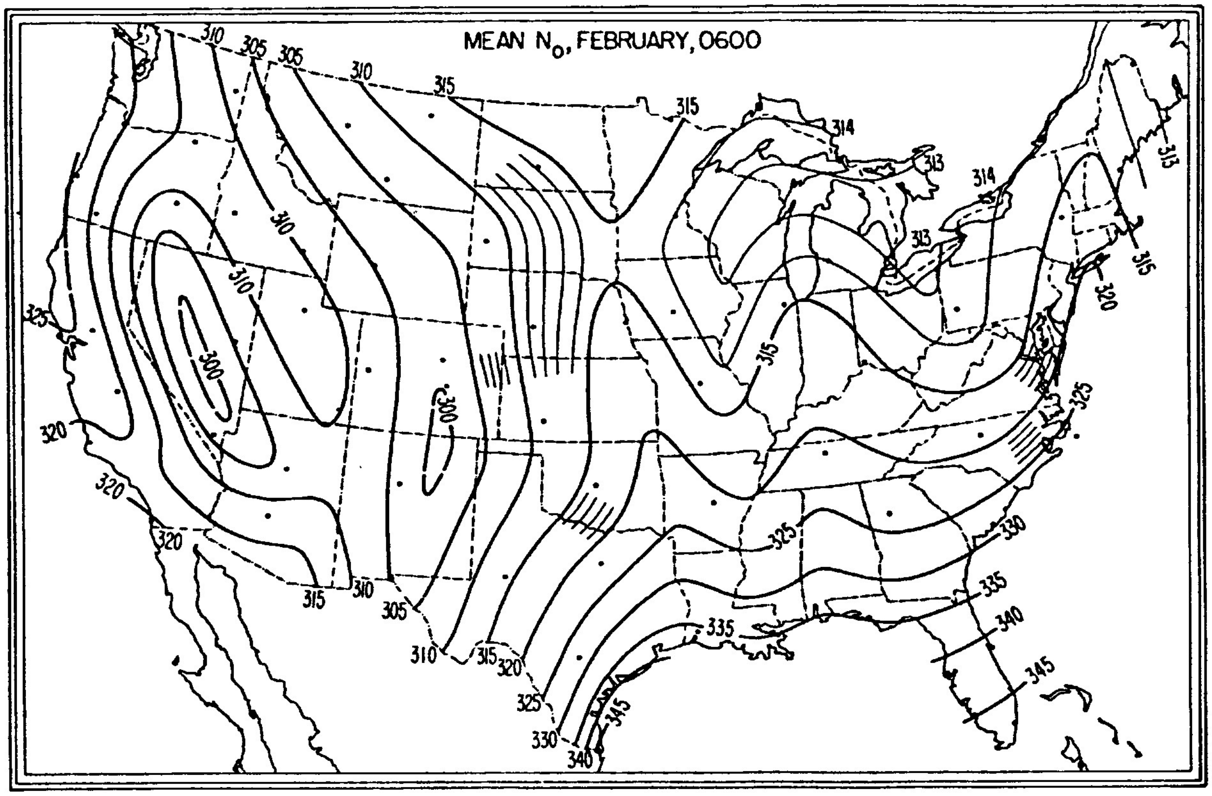

FIGURE 13. $\overline{N}_o$, *February, 0600 local time.*

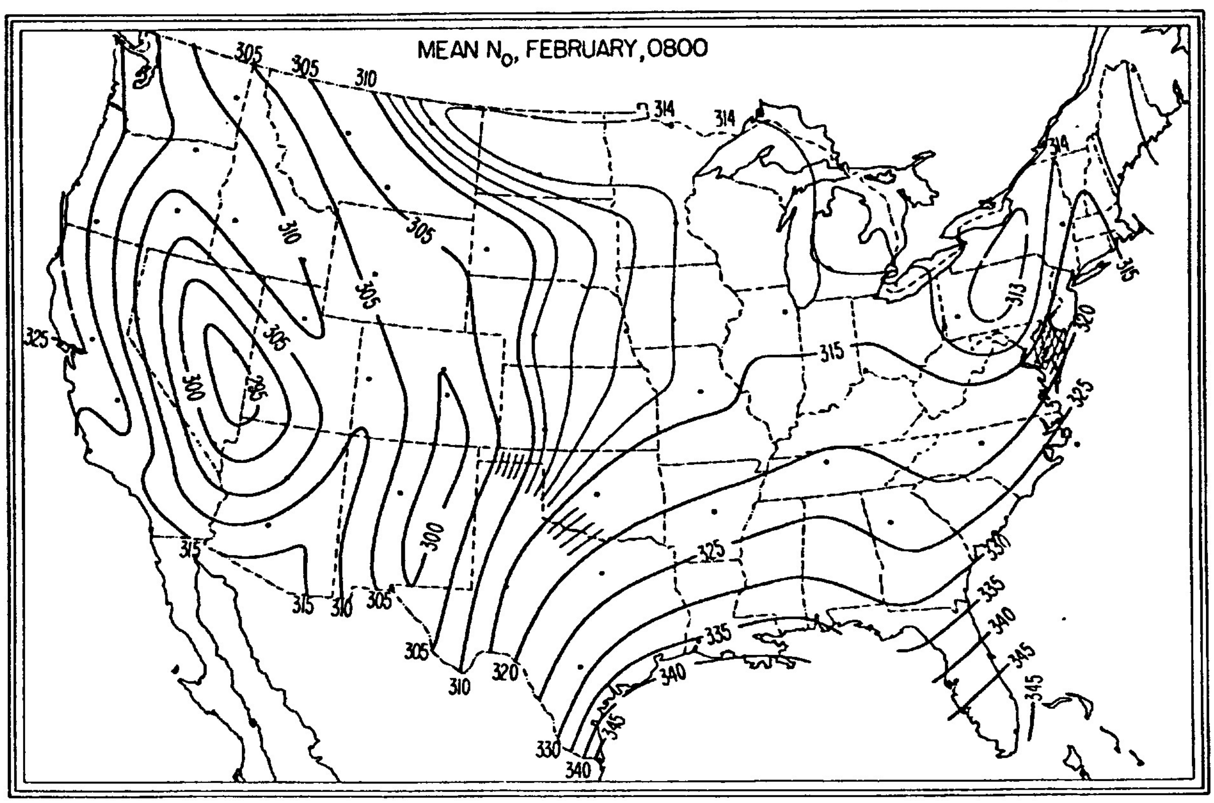

FIGURE 14. $\overline{N}_o$, *February, 0800 local time.*

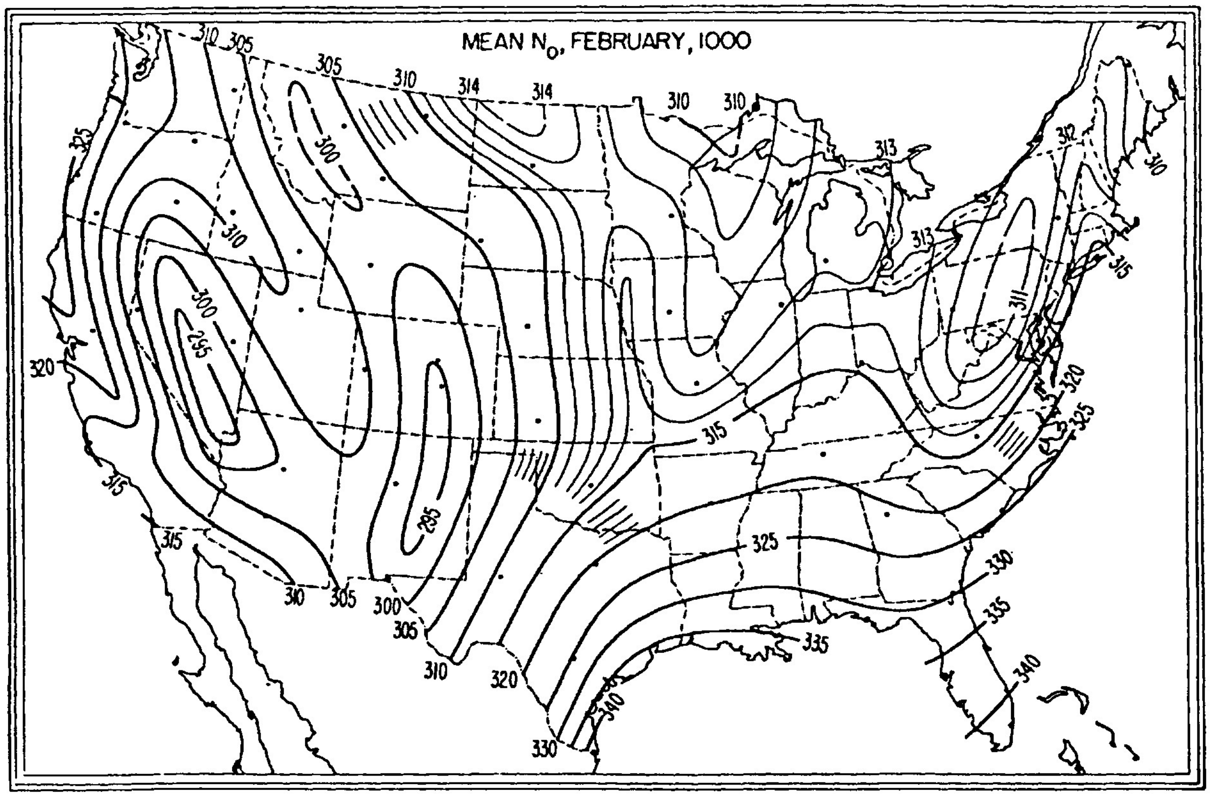

FIGURE 15. $\overline{N}_o$, *February, 1000 local time.*

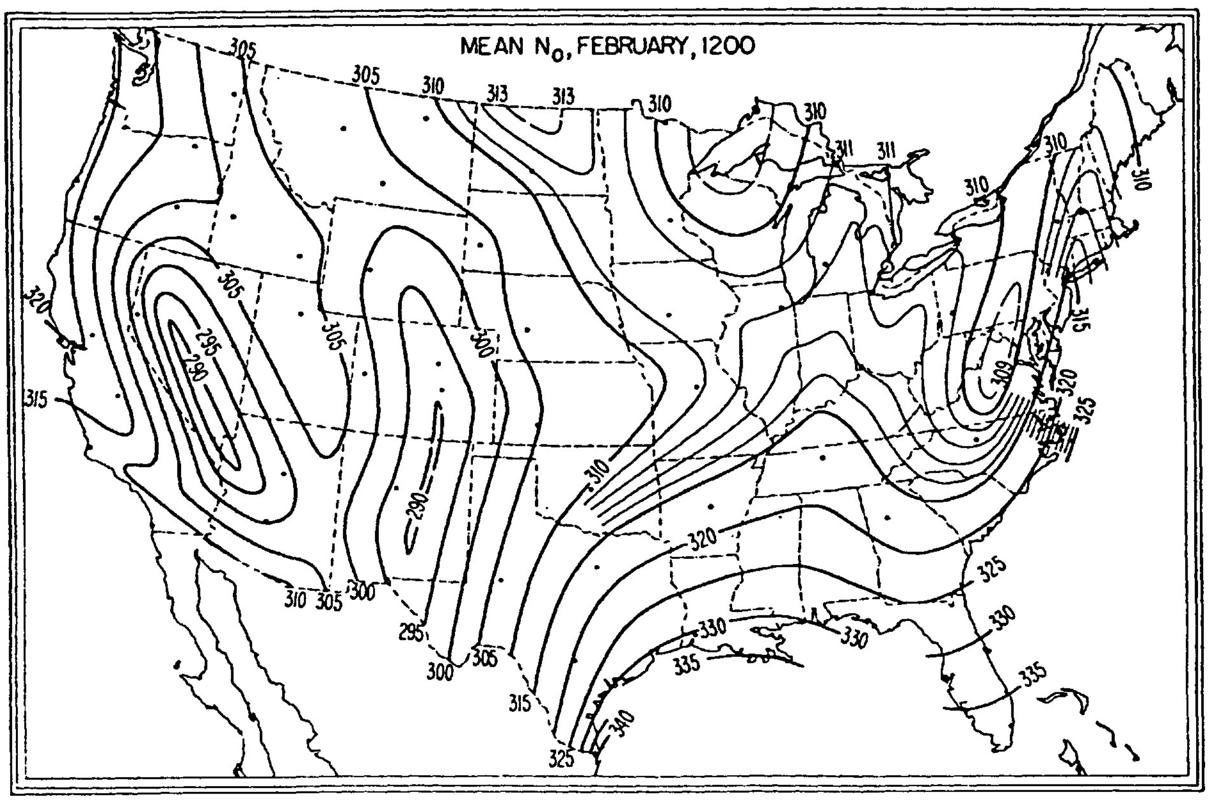

FIGURE 16. $\overline{N}_o$, *February, 1200 local time.*

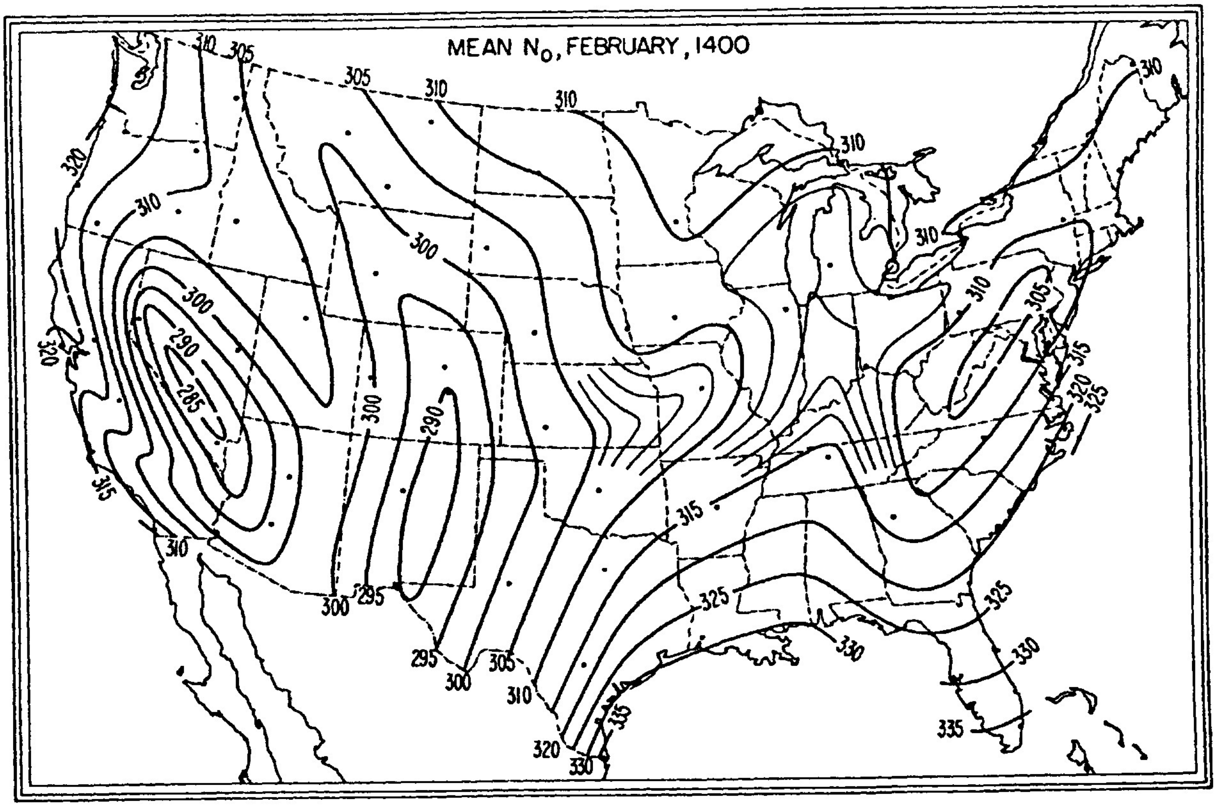

FIGURE 17. $\overline{N}_o$, *February, 1400 local time.*

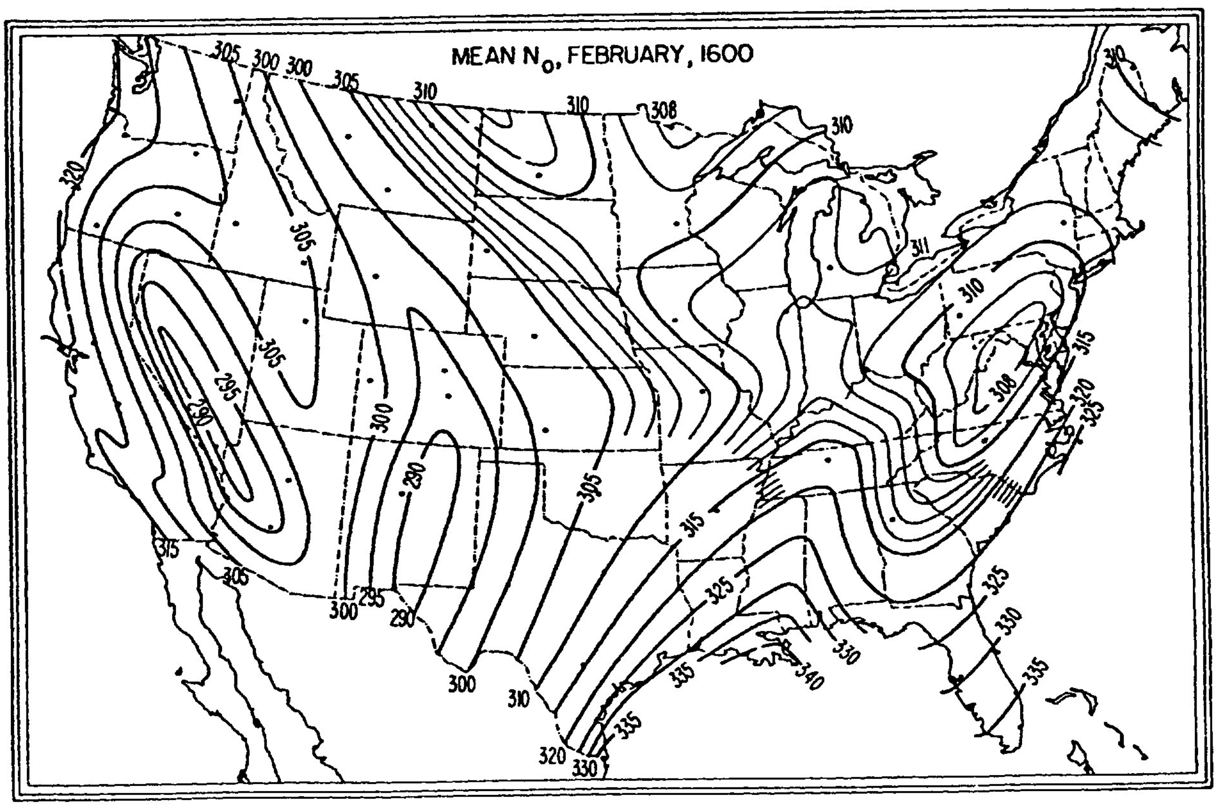

FIGURE 18. $\overline{N}_o$, *February, 1600 local time.*

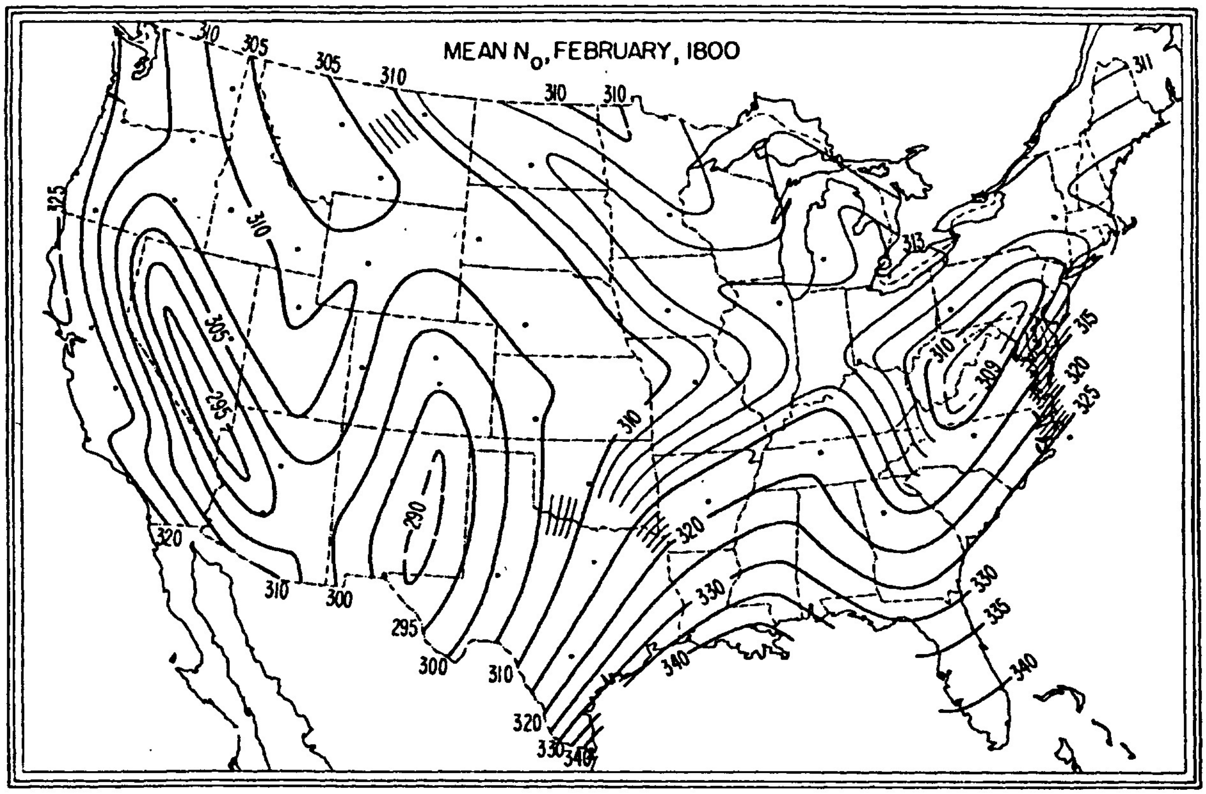

FIGURE 19. $\overline{N}_o$, *February, 1800 local time.*

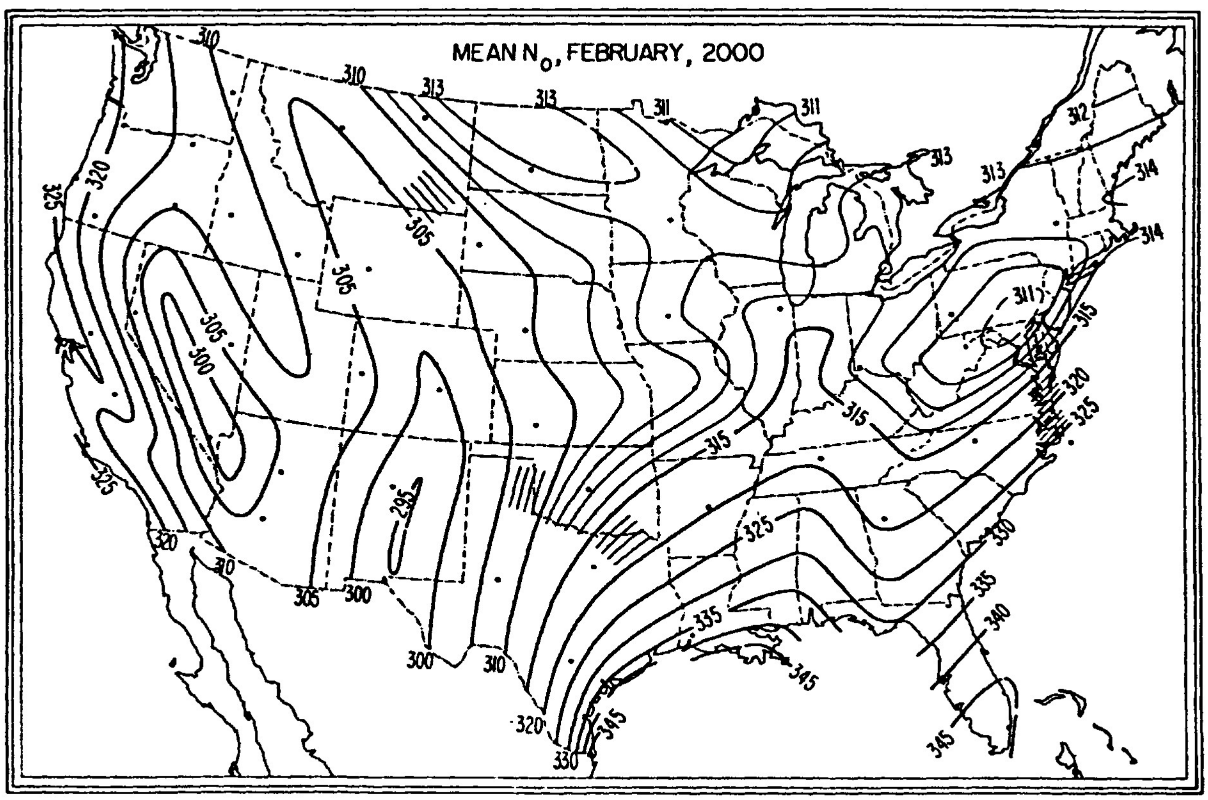

FIGURE 20. $\overline{N}_o$, *February, 2000 local time.*

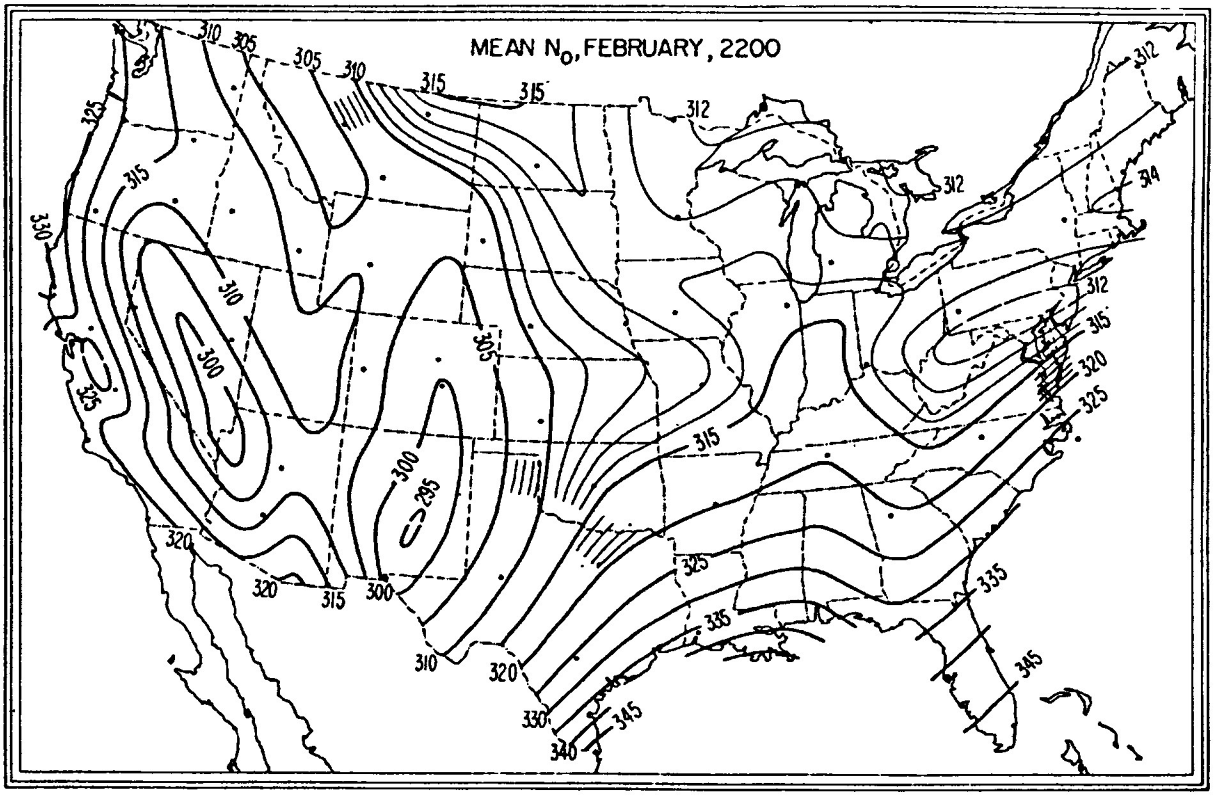

FIGURE 21. $\overline{N}_o$, *February, 2200 local time.*

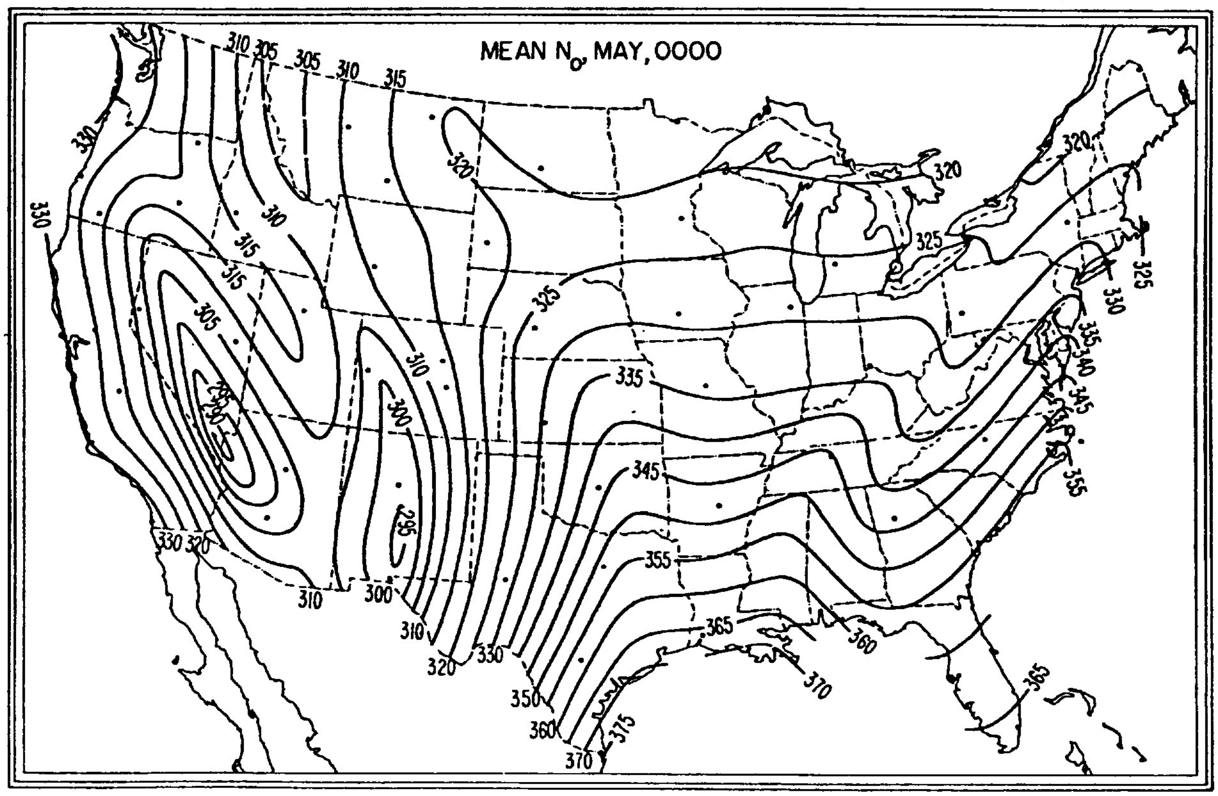

FIGURE 22. $\overline{N}_o$, *May, 0000 local time.*

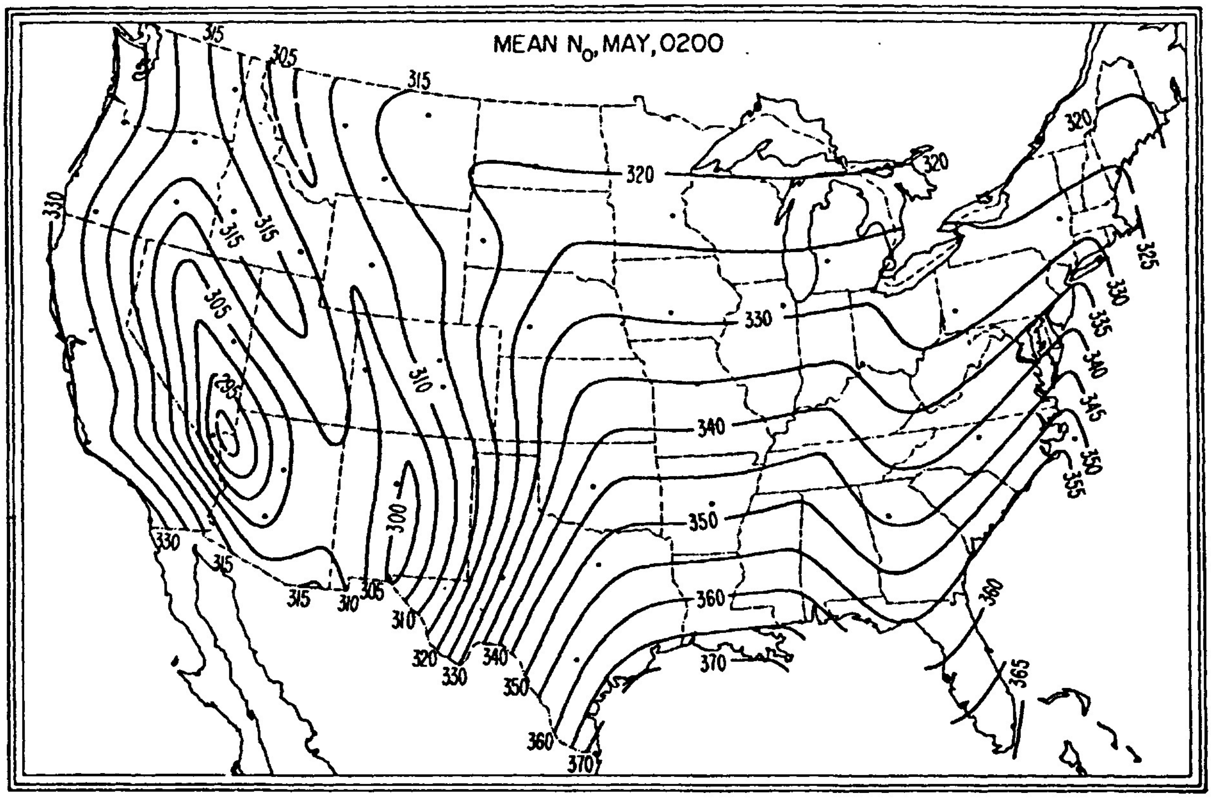

FIGURE 23. $\overline{N}_o$, *May, 0200 local time.*

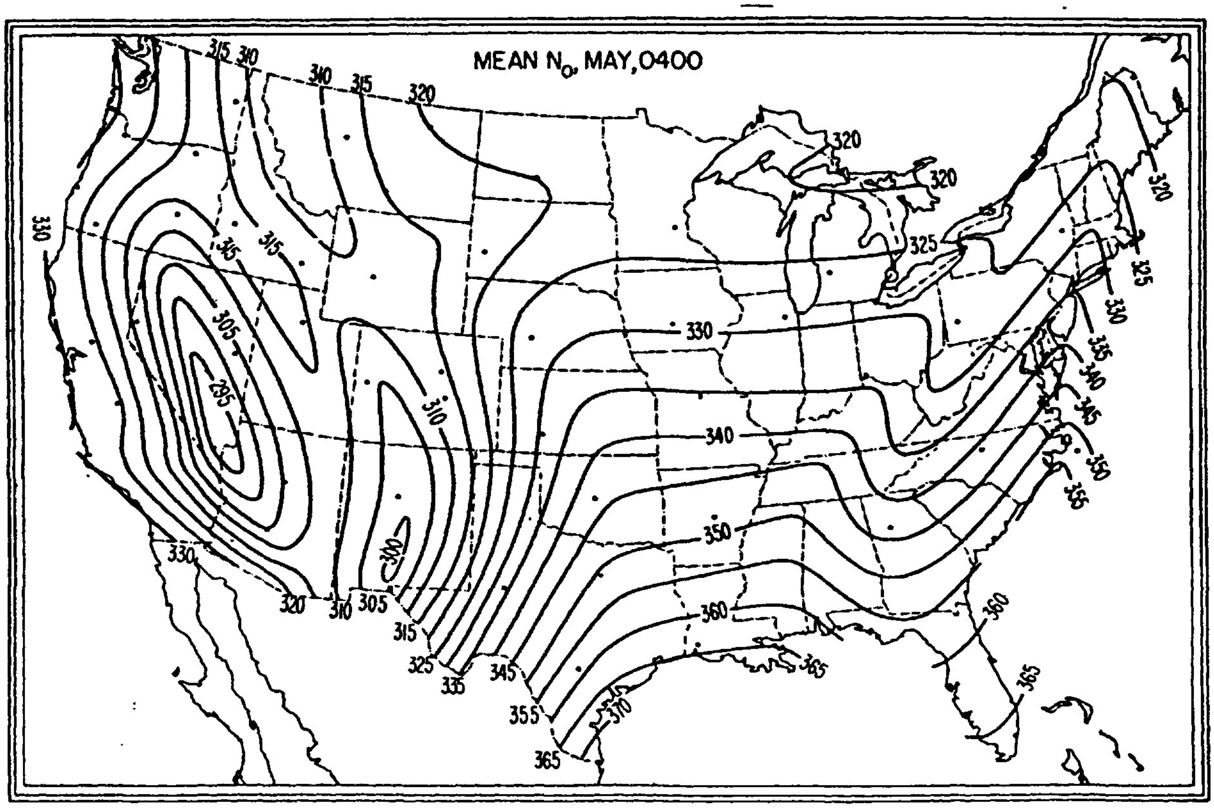

FIGURE 24. $\overline{N}_o$, *May, 0400 local time.*

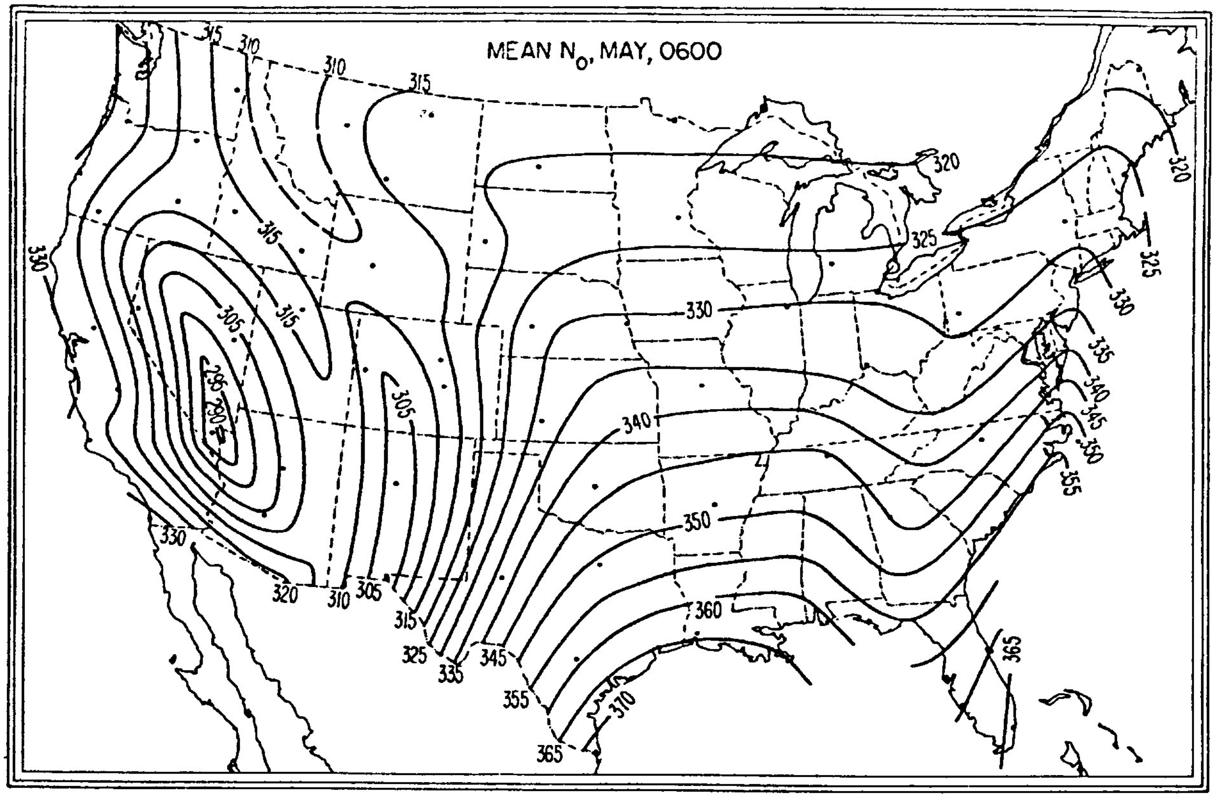

FIGURE 25. $\overline{N}_o$, *May, 0600 local time.*

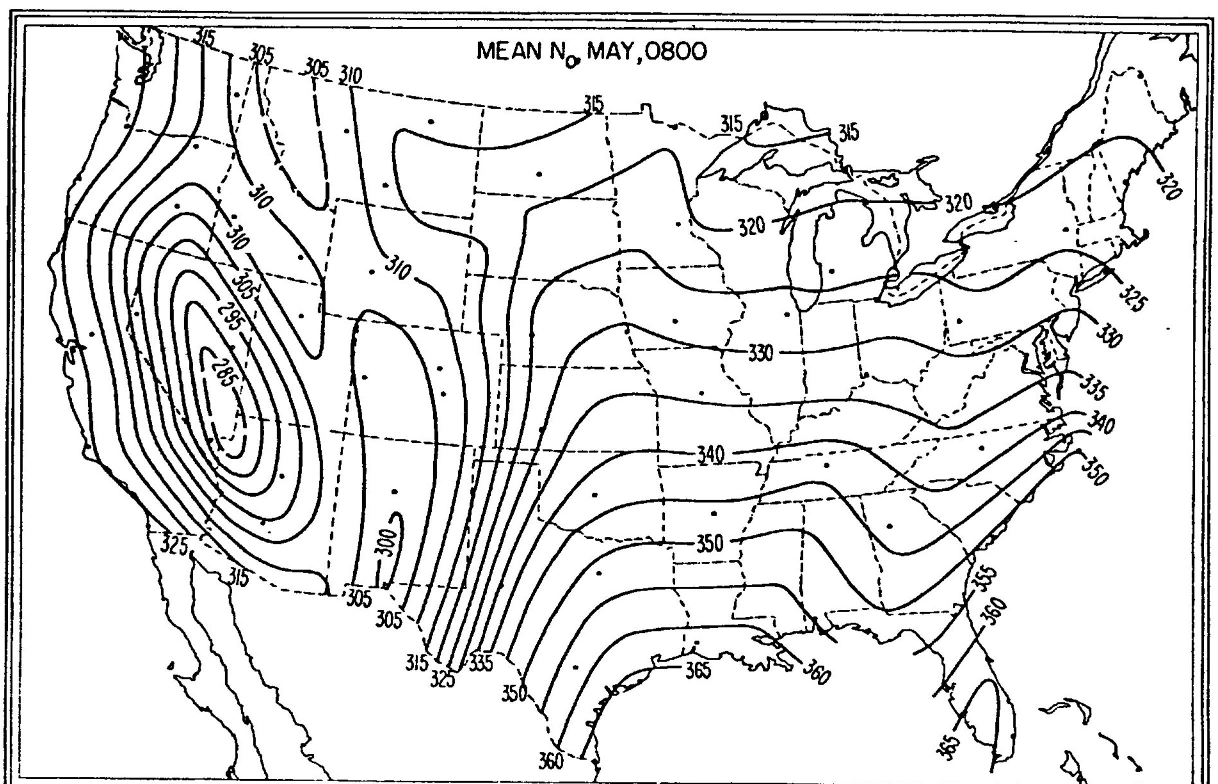

FIGURE 26. $\overline{N}_o$, *May, 0800 local time.*

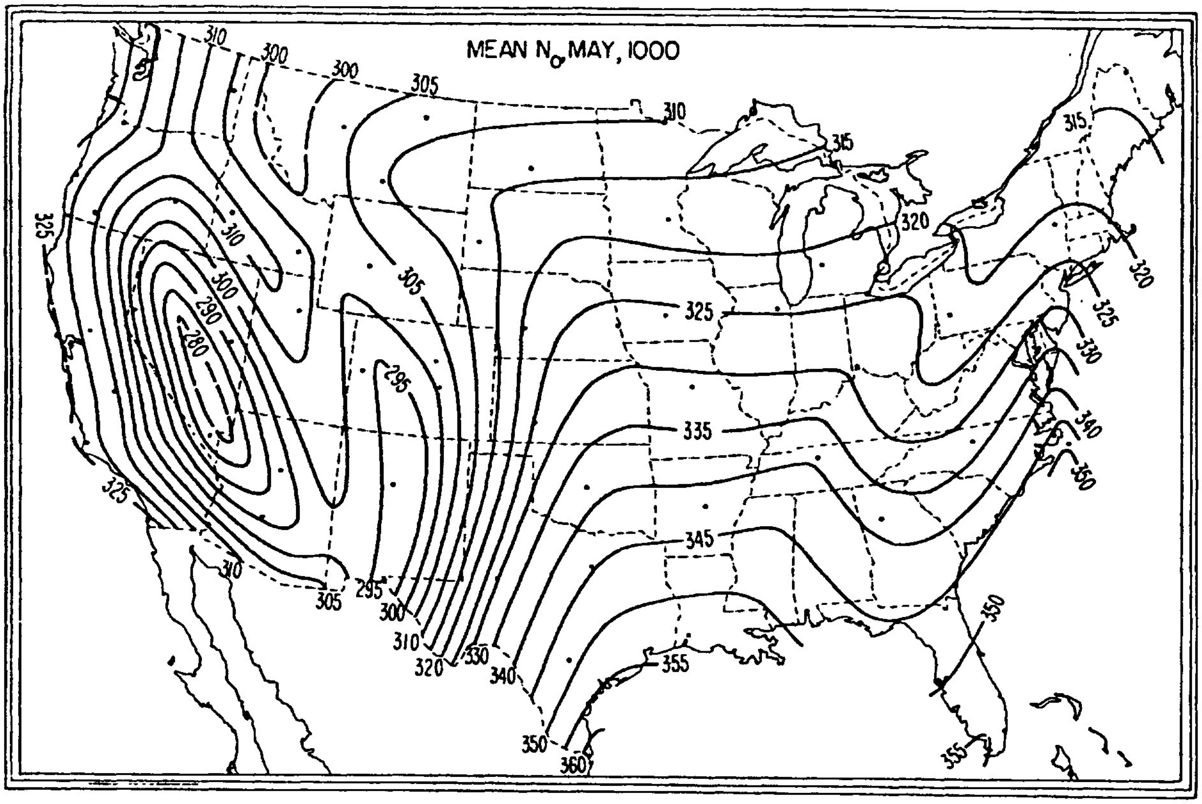

FIGURE 27. $\overline{N}_o$, *May, 1000 local time.*

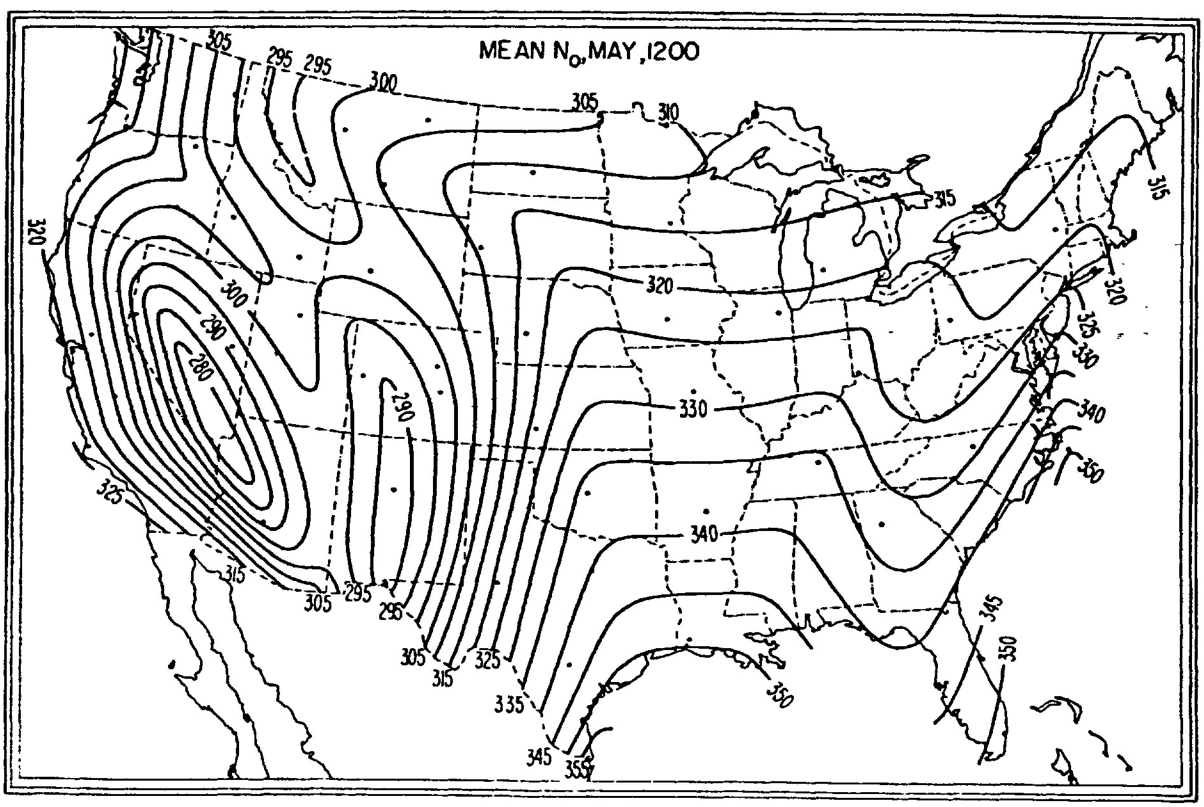

FIGURE 28. $\overline{N}_o$, *May, 1200 local time.*

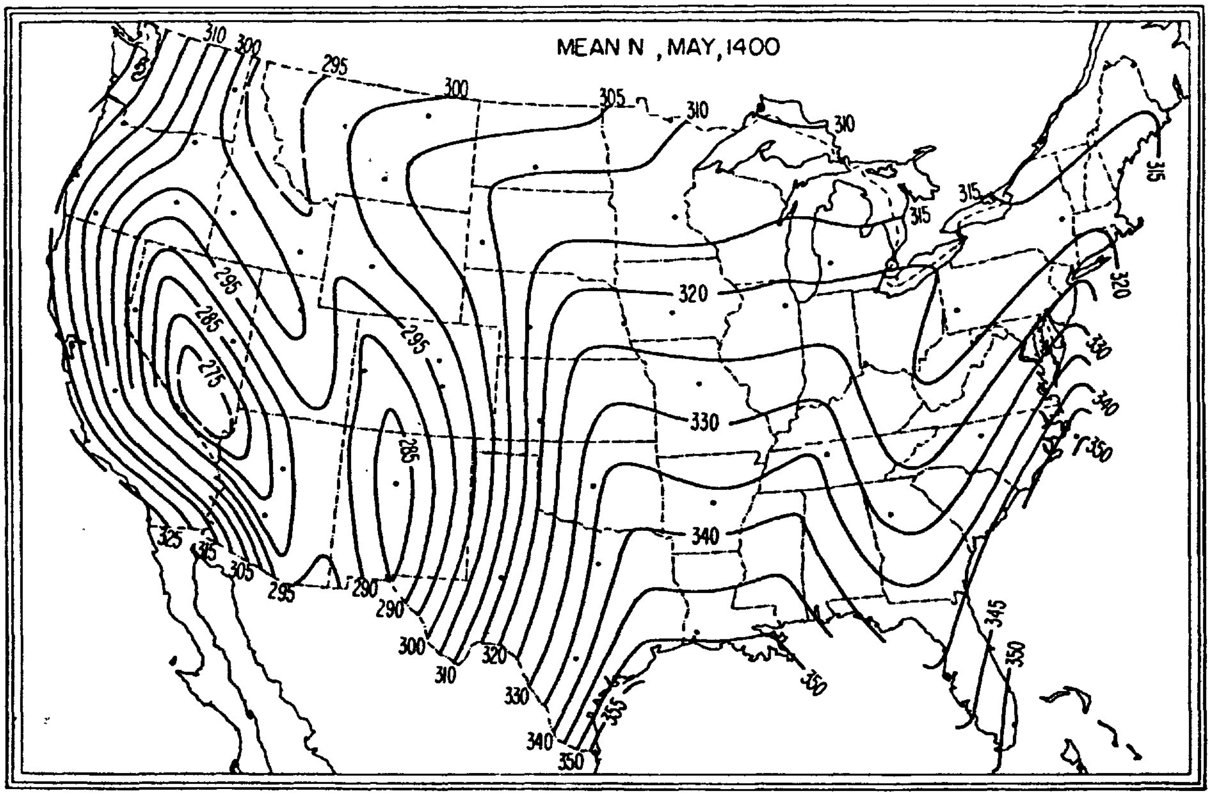

FIGURE 29. $\overline{N}_s$, *May, 1400 local time.*

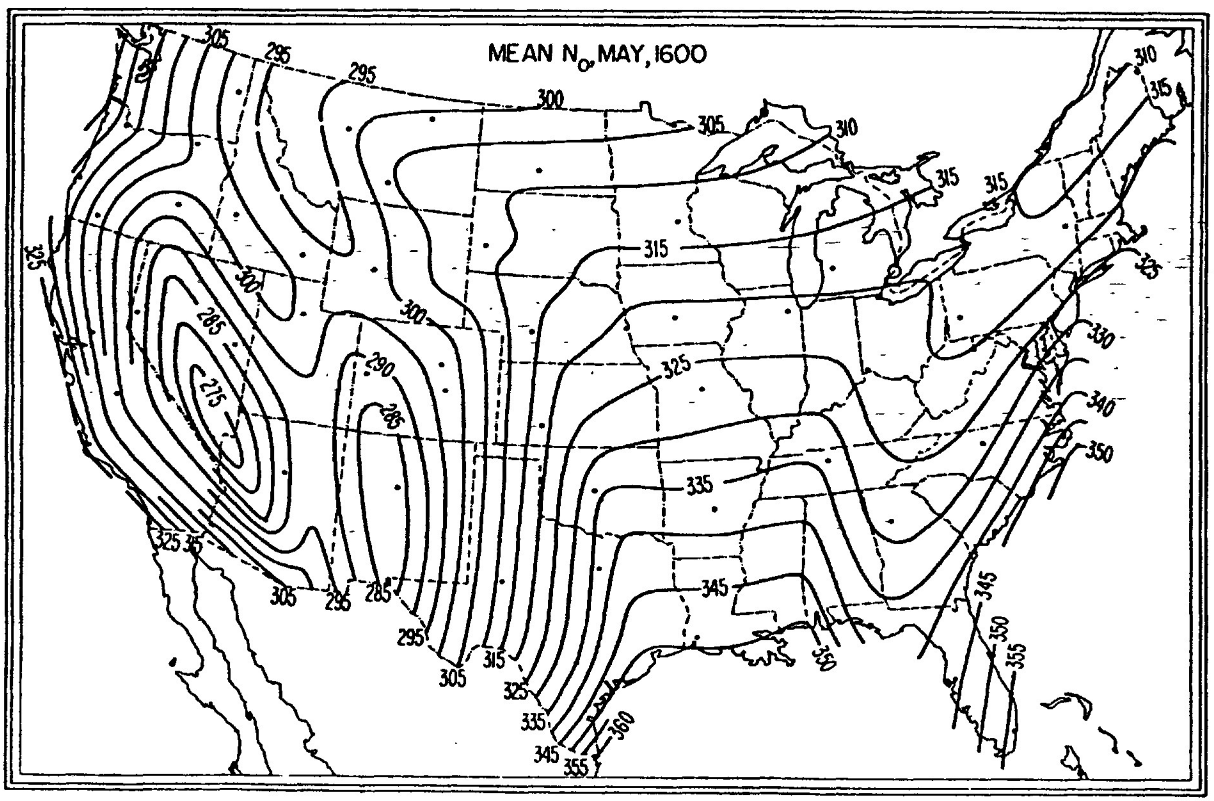

FIGURE 30. $\overline{N}_s$, *May, 1600 local time.*

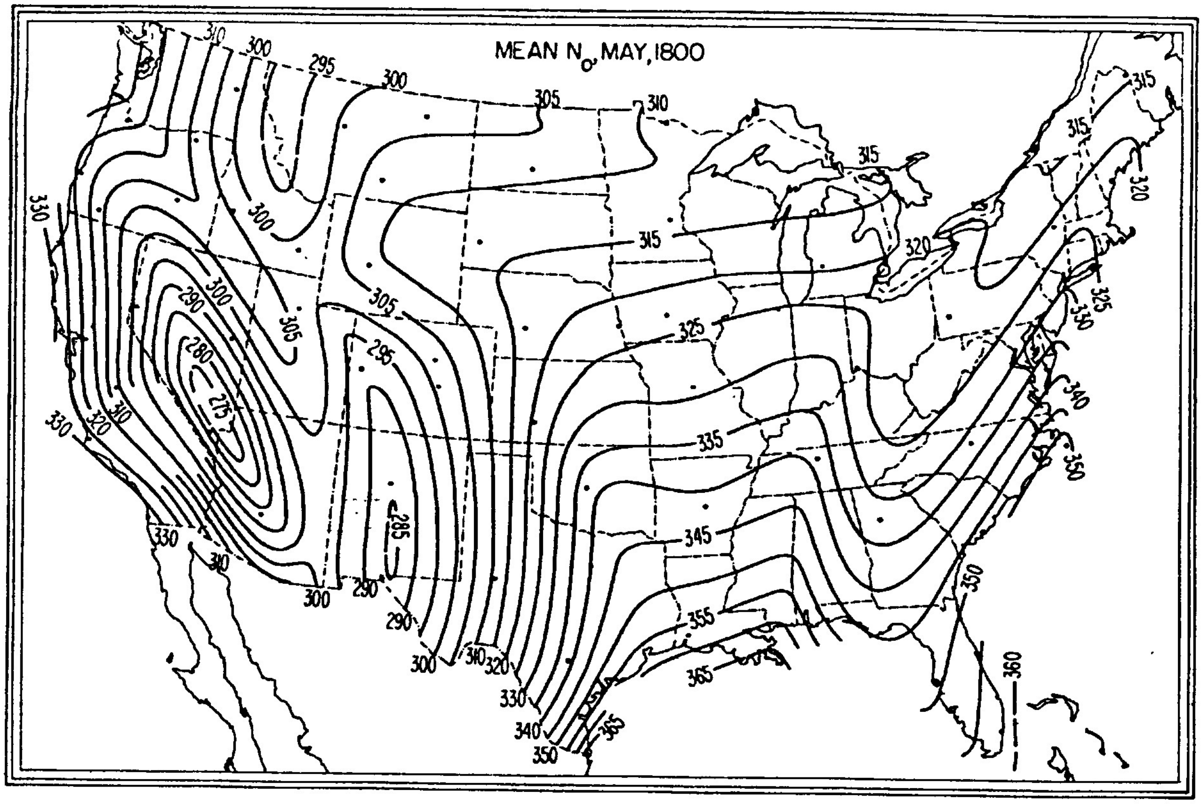

Figure 31. $\overline{N}_o$, *May, 1800 local time.*

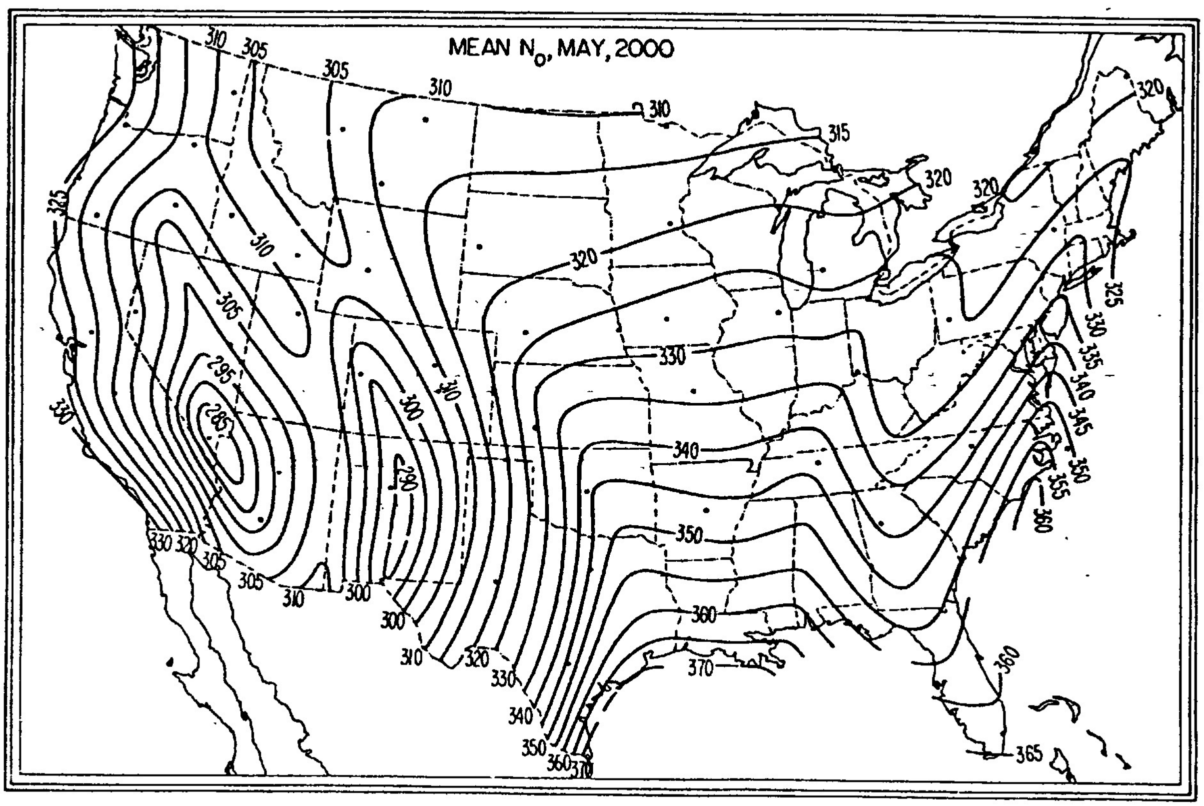

Figure 32. $\overline{N}_o$, *May, 2000 local time.*

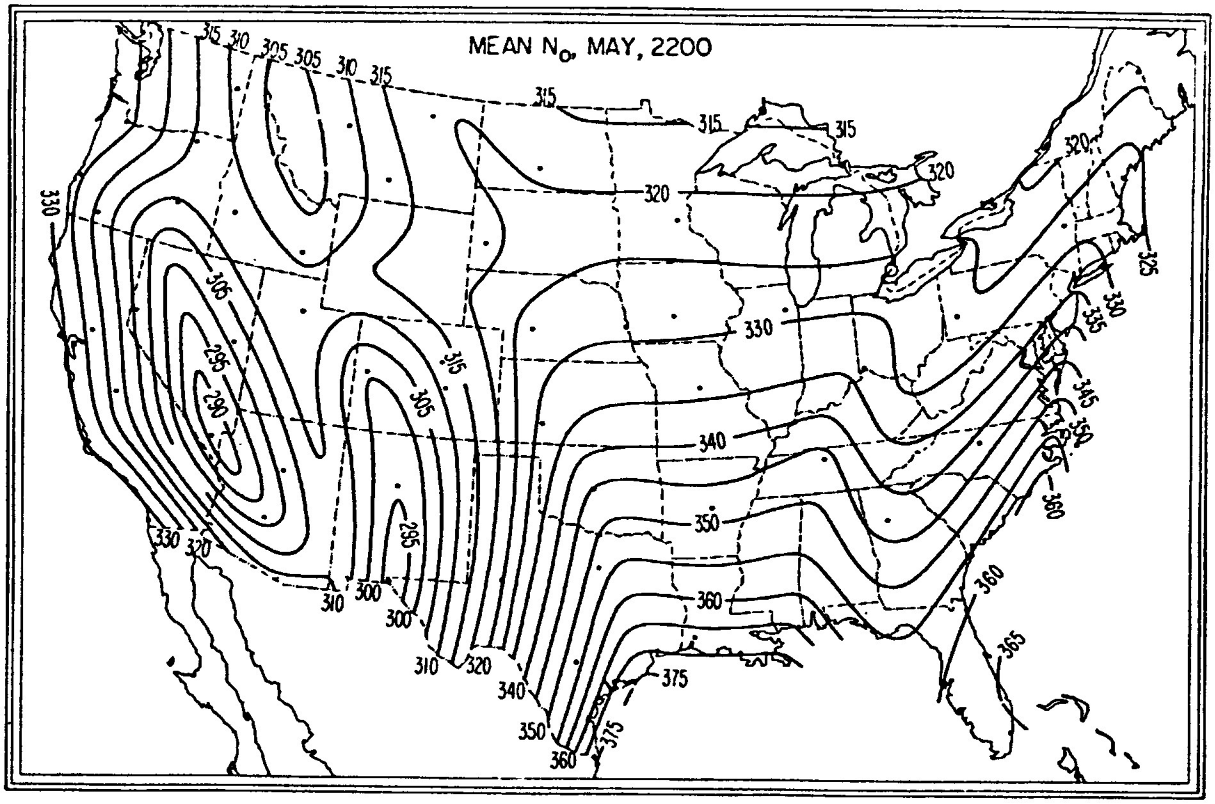

FIGURE 33. $\overline{N}_o$, *May, 2200 local time.*

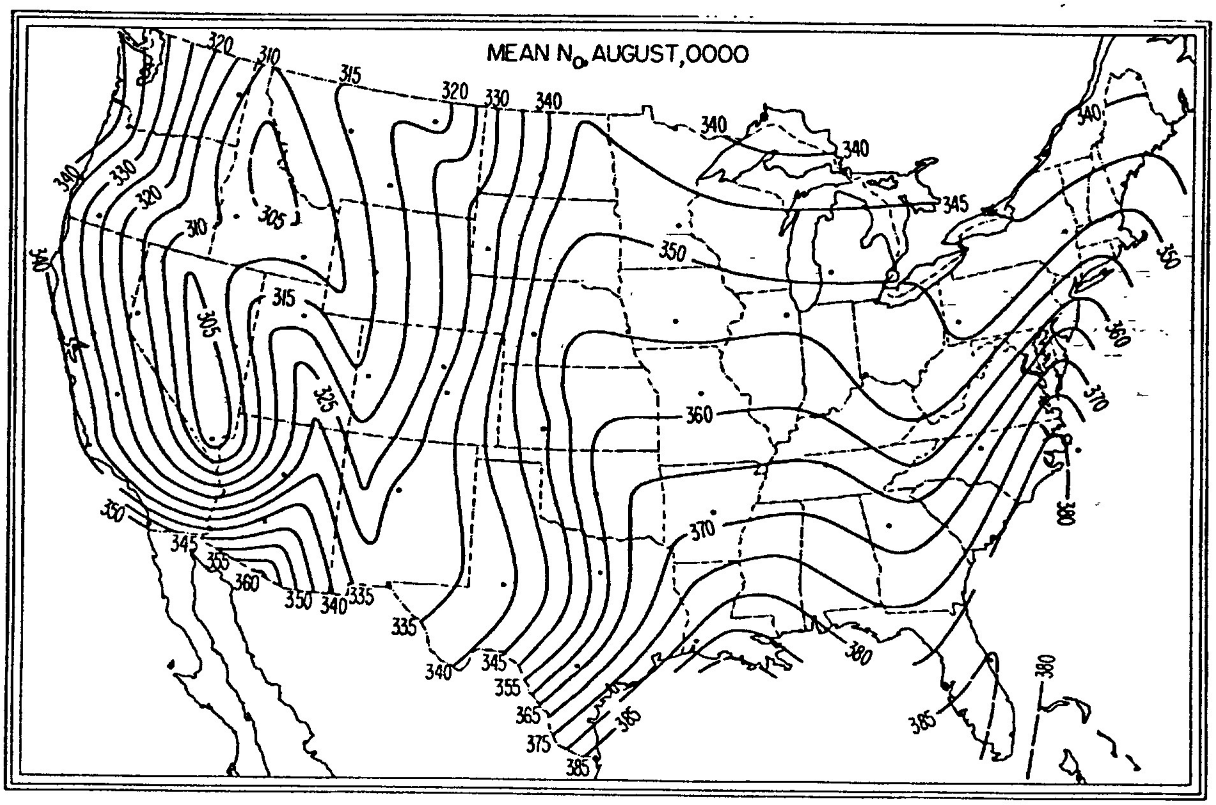

FIGURE 34. $\overline{N}_o$, *August, 0000 local time.*

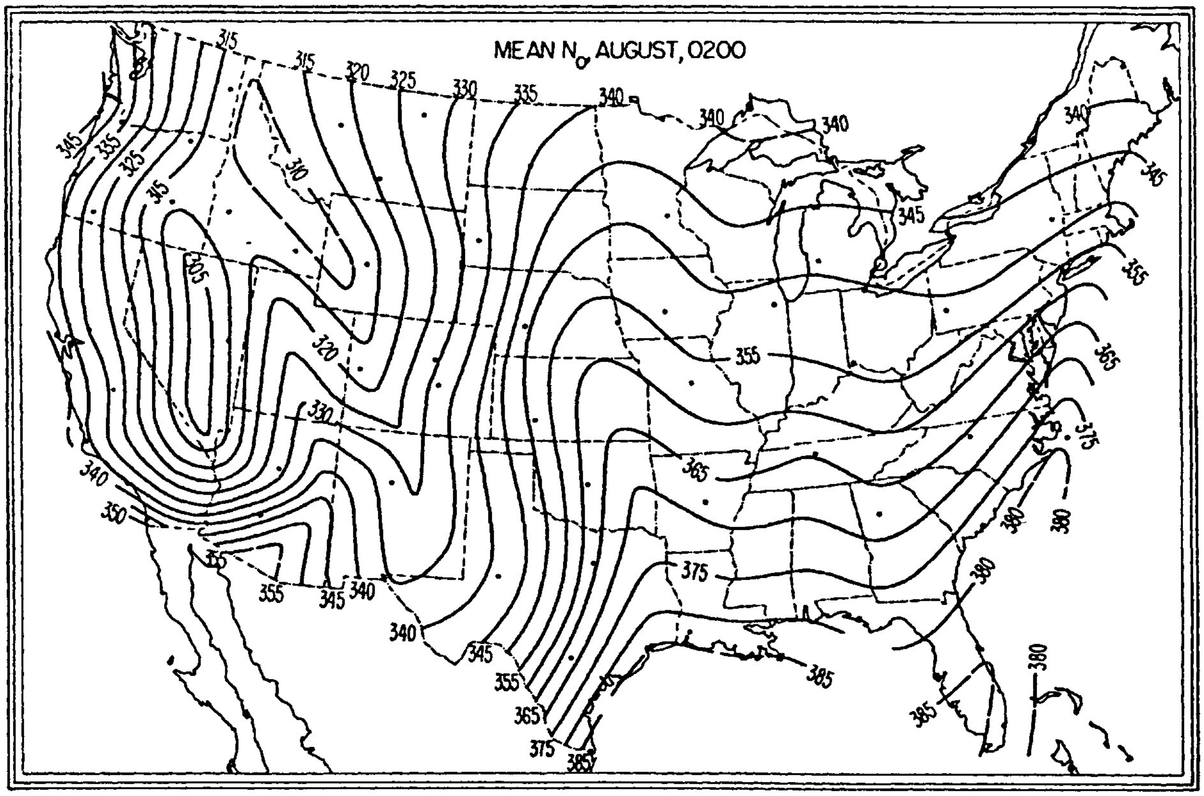

Figure 35. $\overline{N}_o$, *August, 0200 local time.*

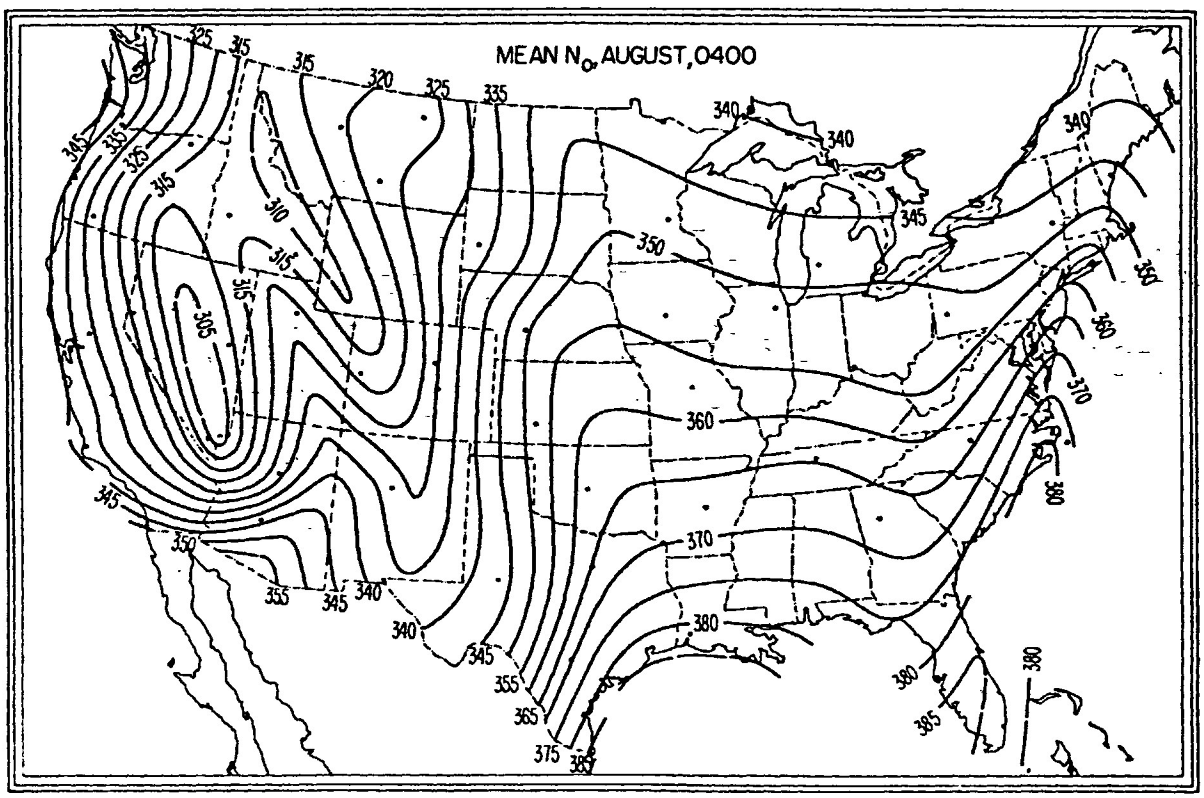

Figure 36. $\overline{N}_o$, *August, 0400 local time.*

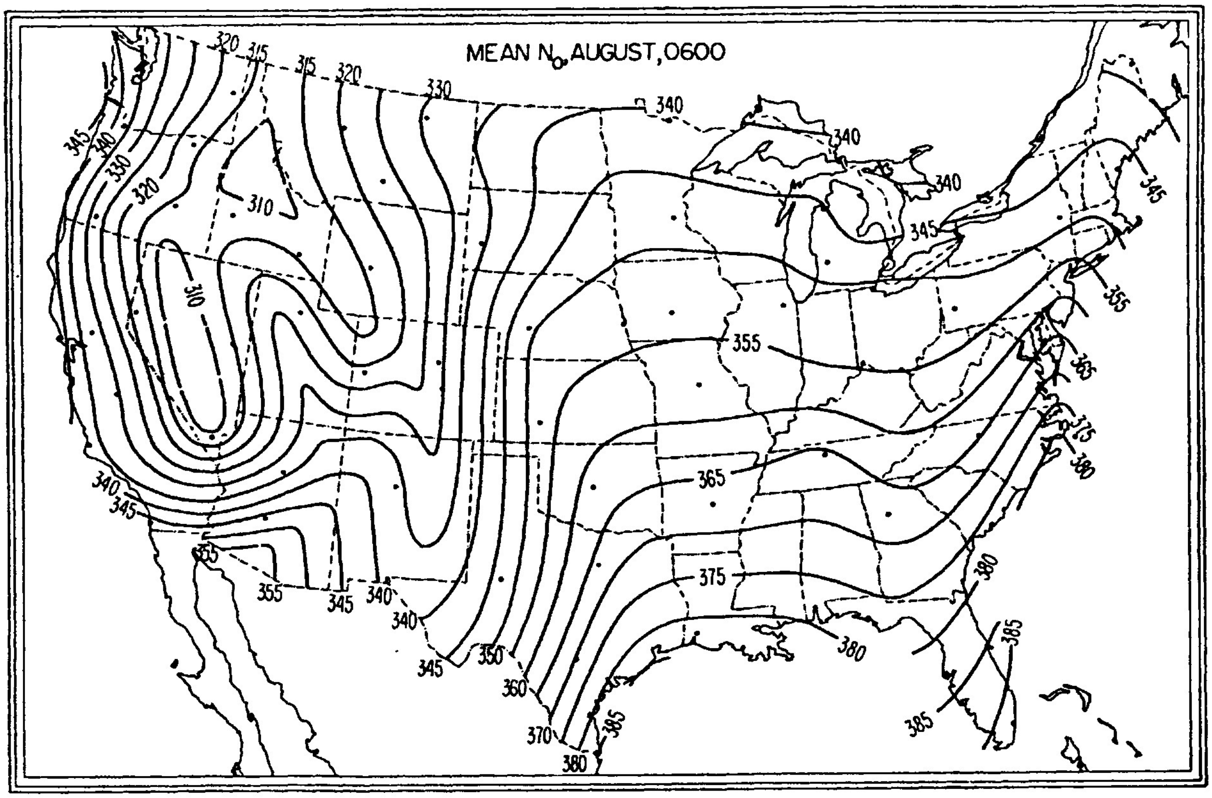

FIGURE 37. $\overline{N}_o$, *August, 0600 local time.*

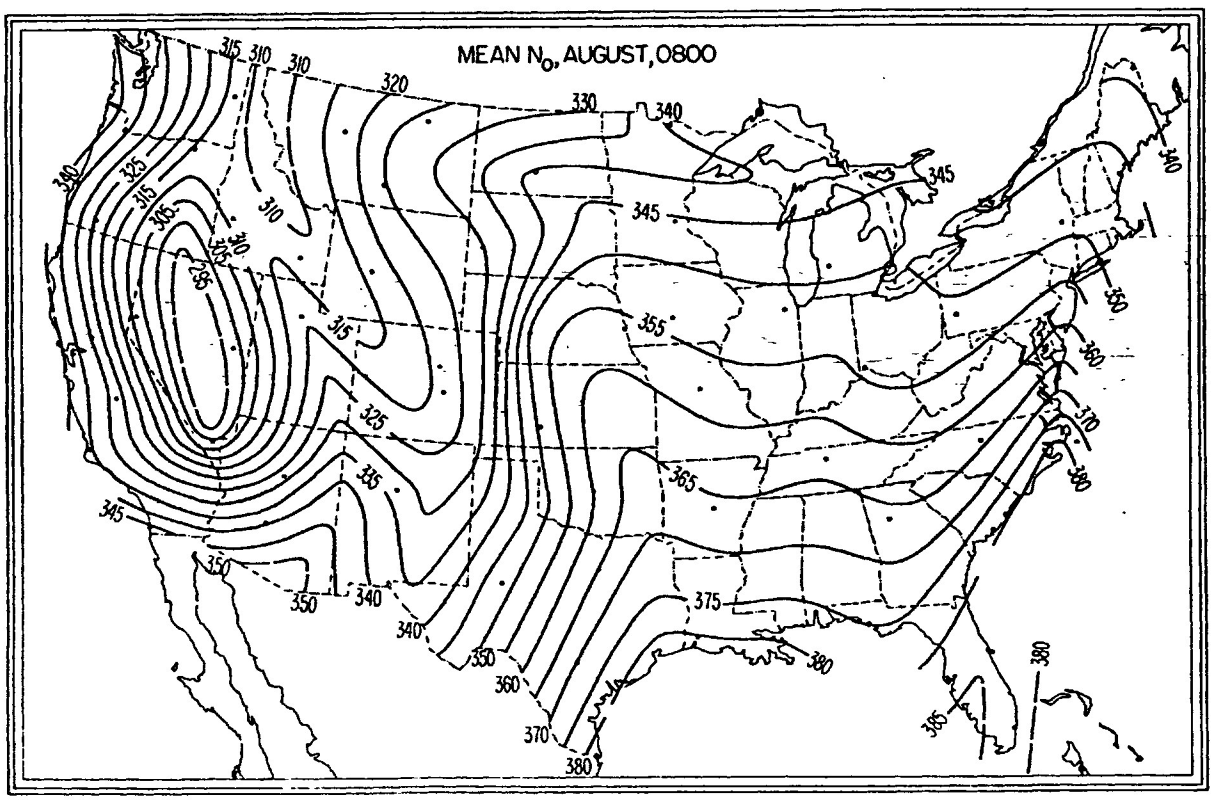

FIGURE 38. $\overline{N}_o$, *August, 0800 local time.*

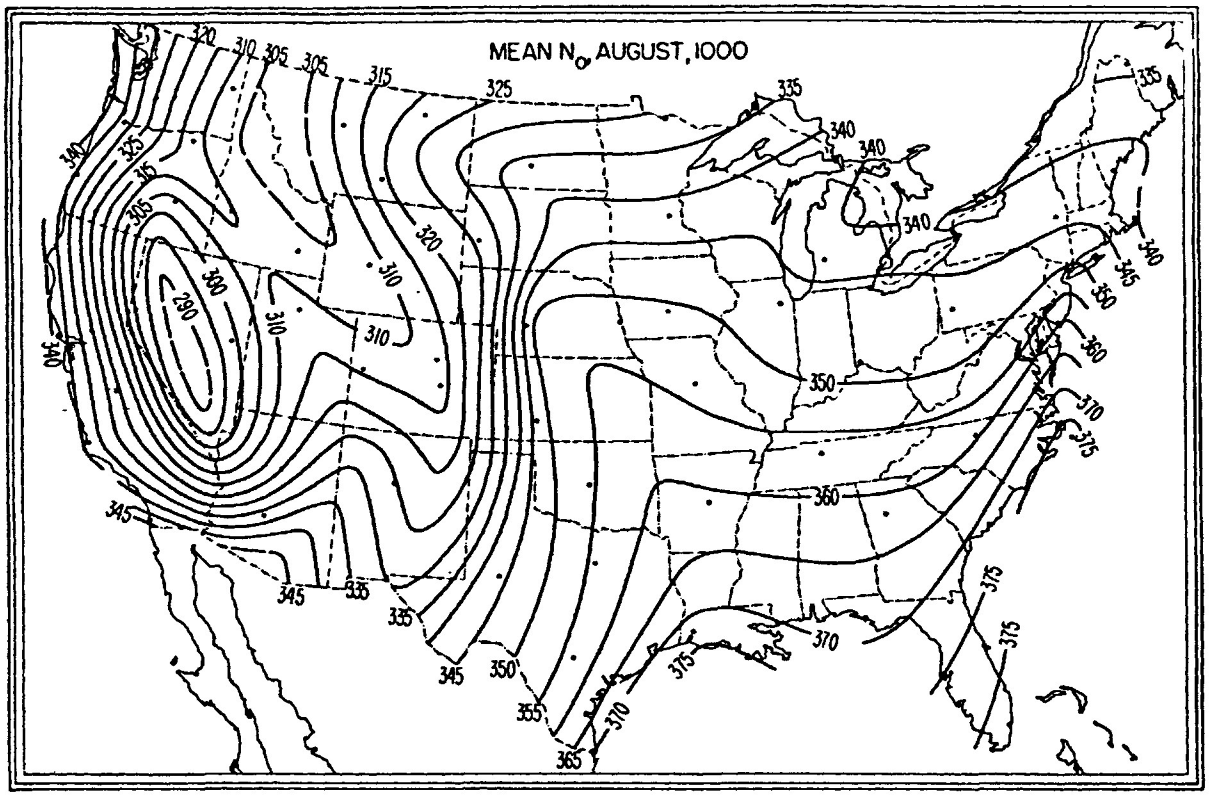

FIGURE 39. $\overline{N}_o$, *August, 1000 local time.*

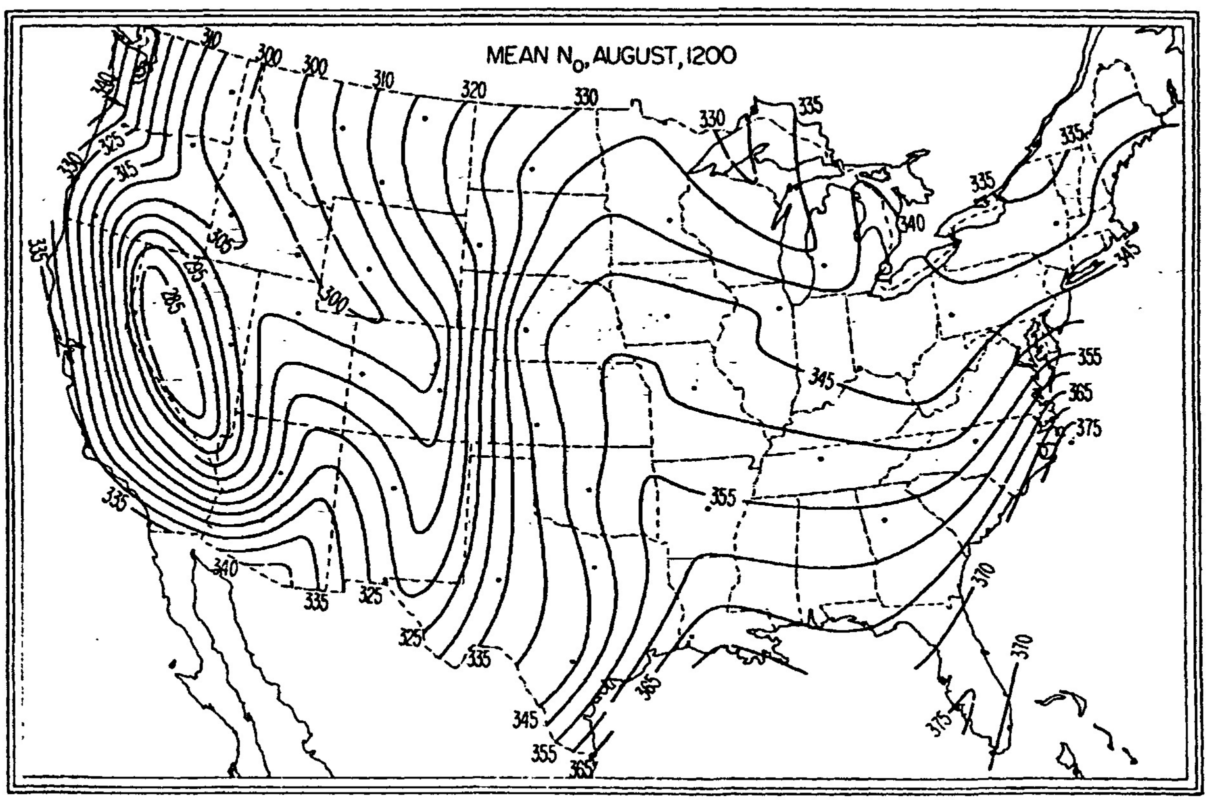

FIGURE 40. $\overline{N}_o$, *August, 1200 local time.*

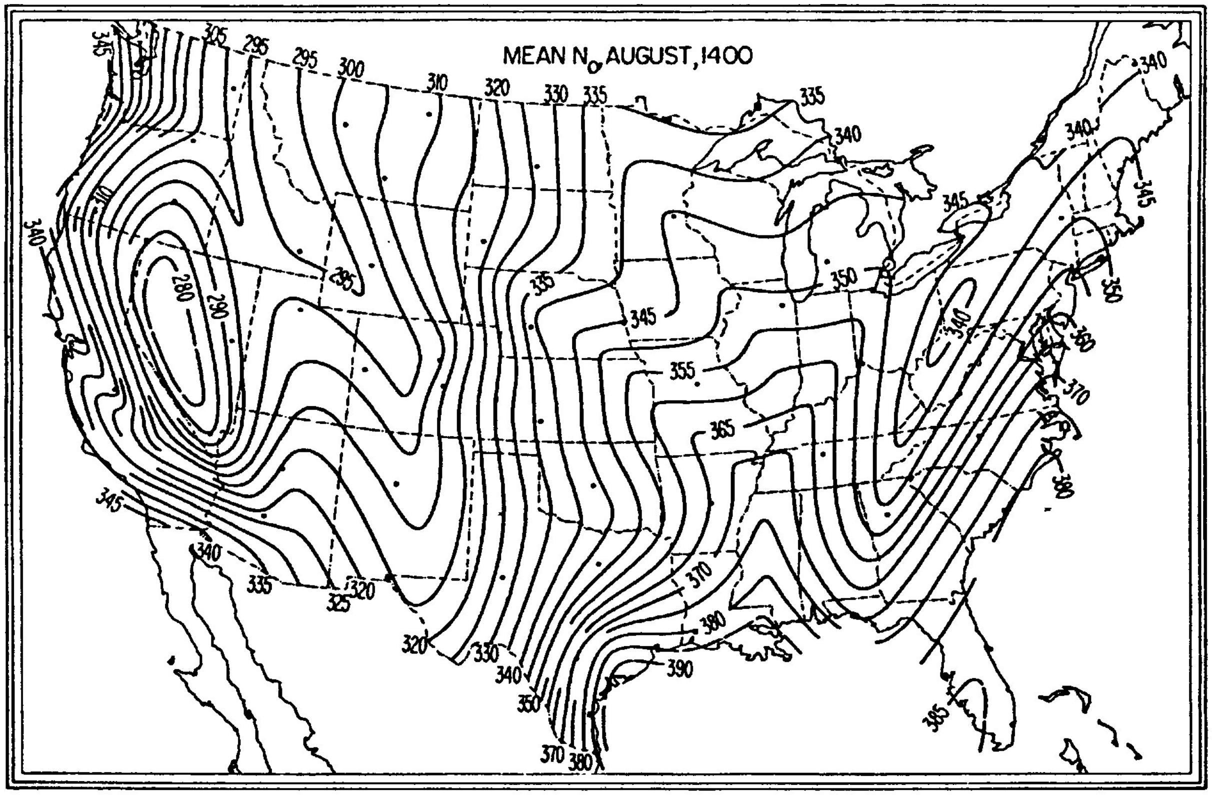

FIGURE 41. $\overline{N}_o$, *August, 1400 local time.*

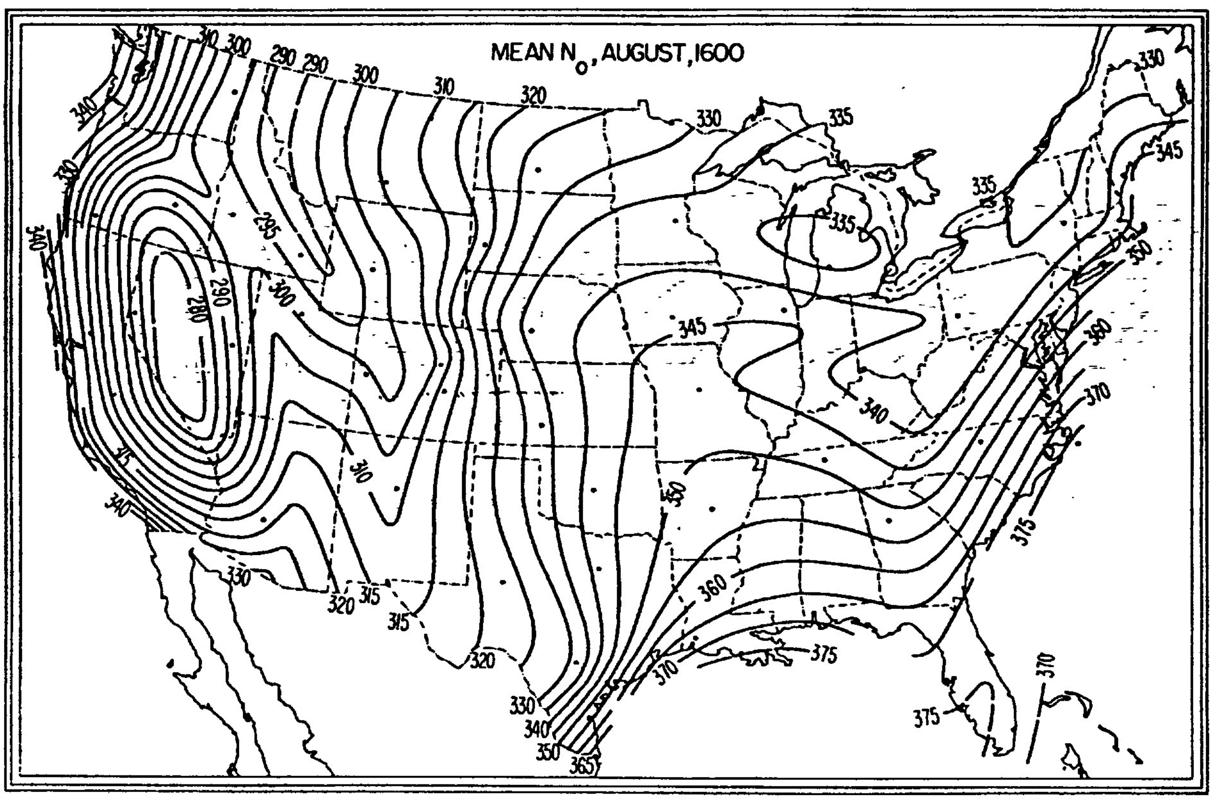

FIGURE 42. $\overline{N}_o$, *August, 1600 local time.*

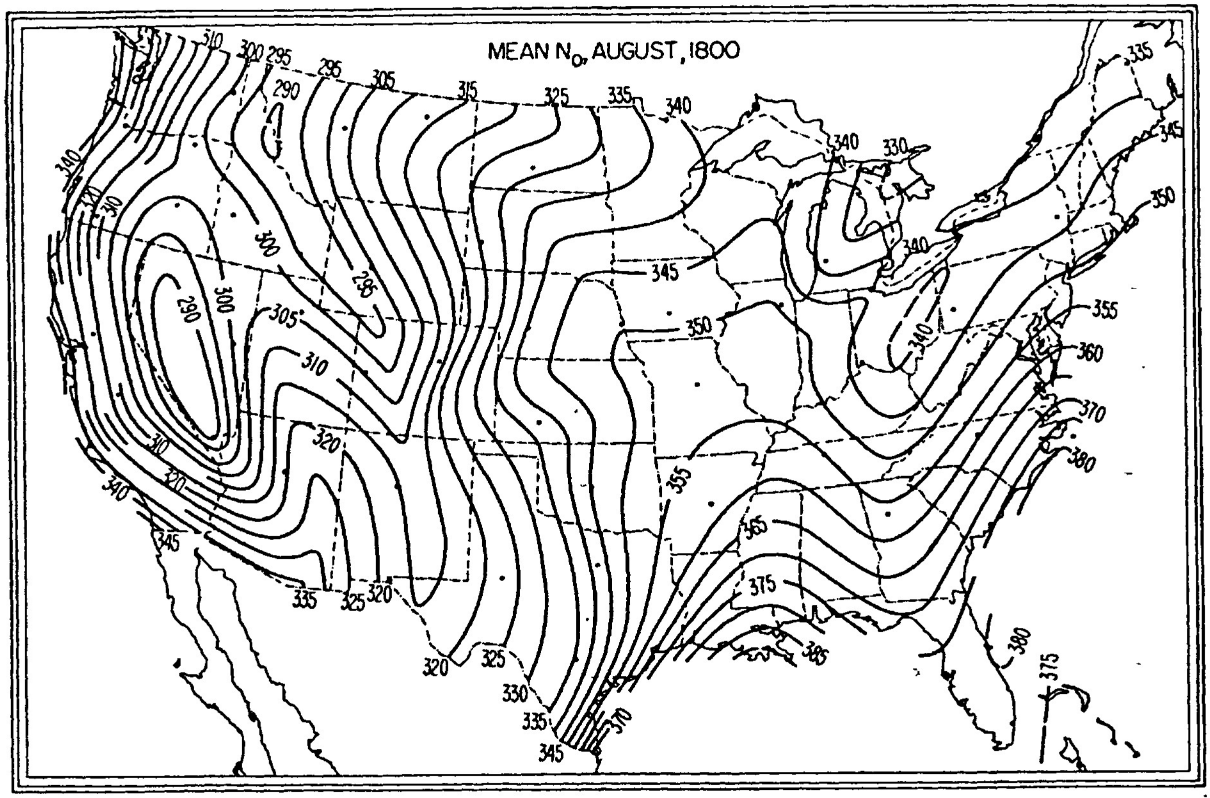

FIGURE 43. $\overline{N}_o$, *August, 1800 local time.*

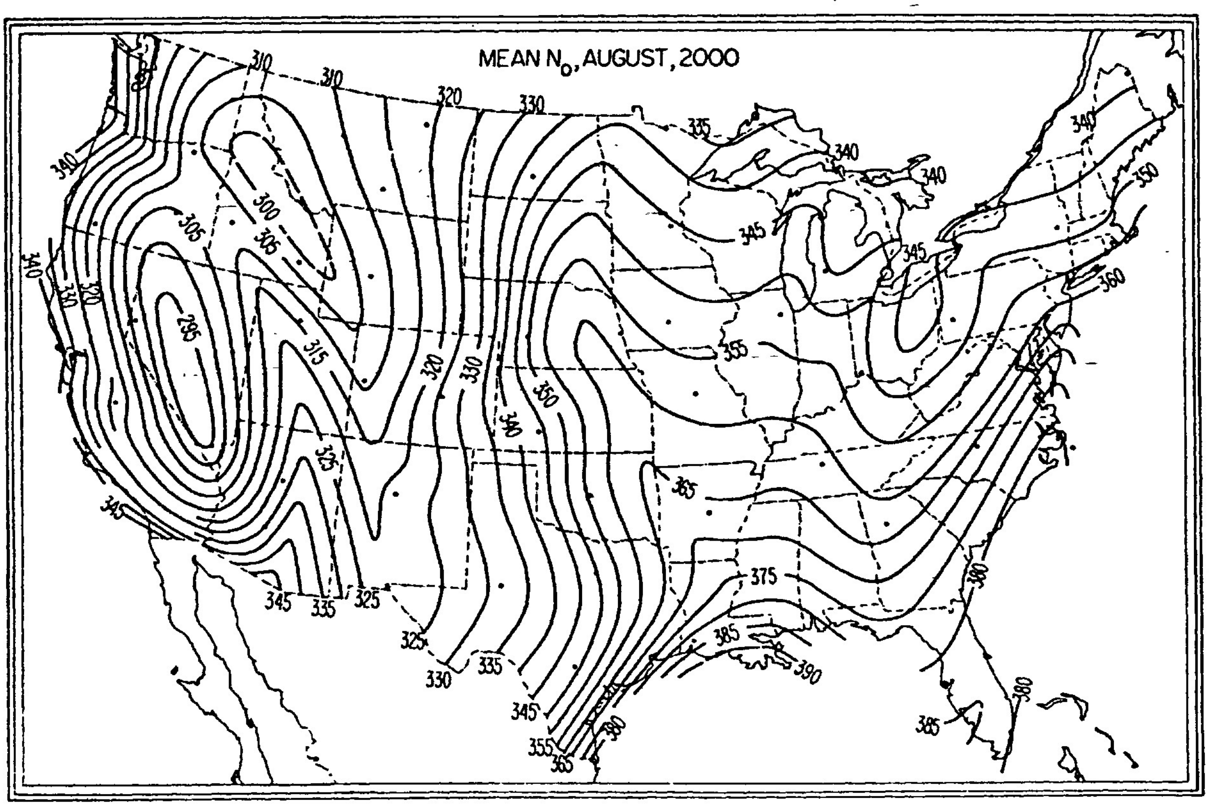

FIGURE 44. $\overline{N}_o$, *August, 2000 local time.*

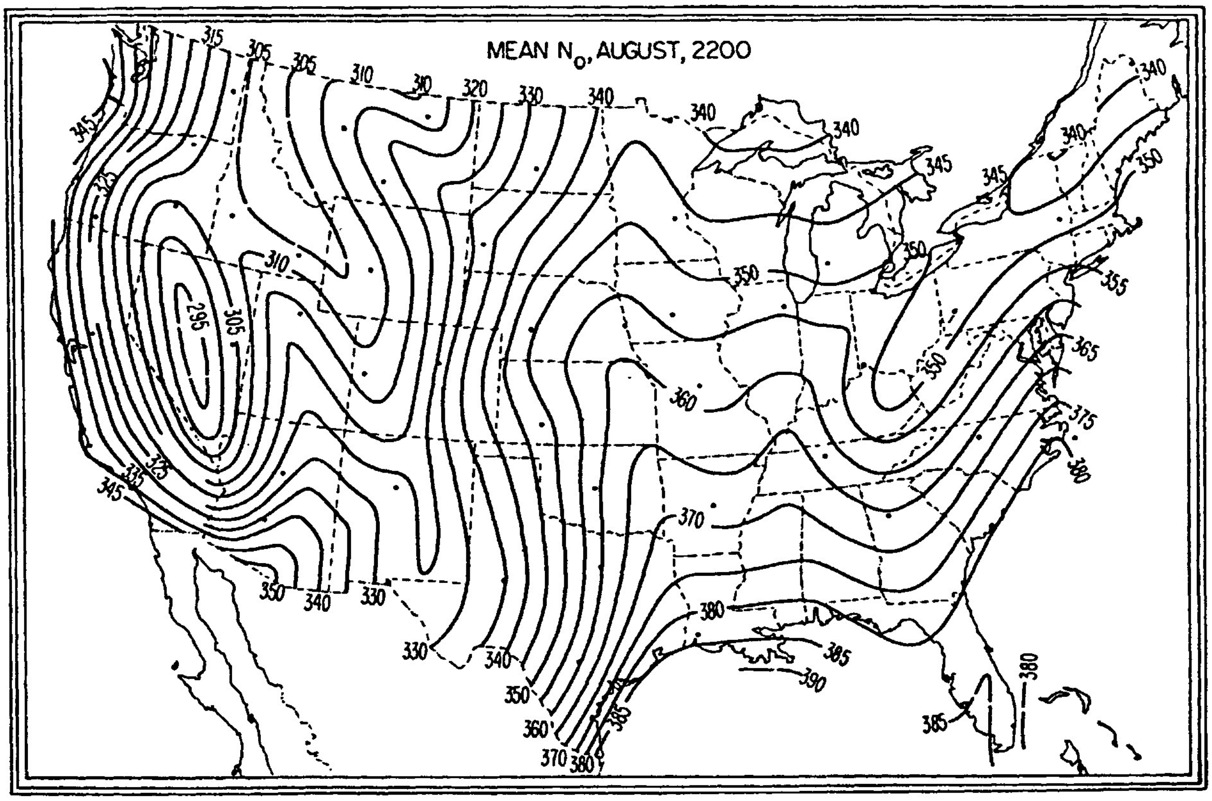

FIGURE 45. $\overline{N}_o$, *August, 2200 local time.*

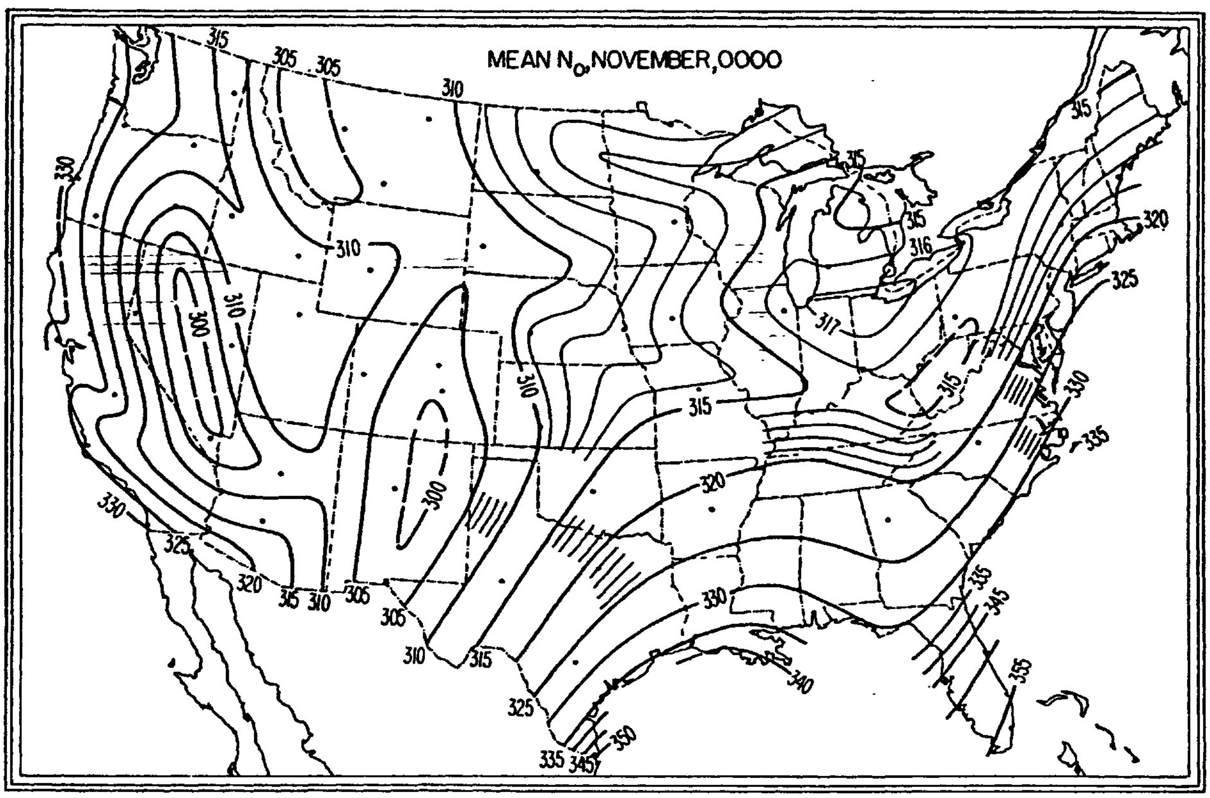

FIGURE 46. $\overline{N}_o$, *November, 0000 local time.*

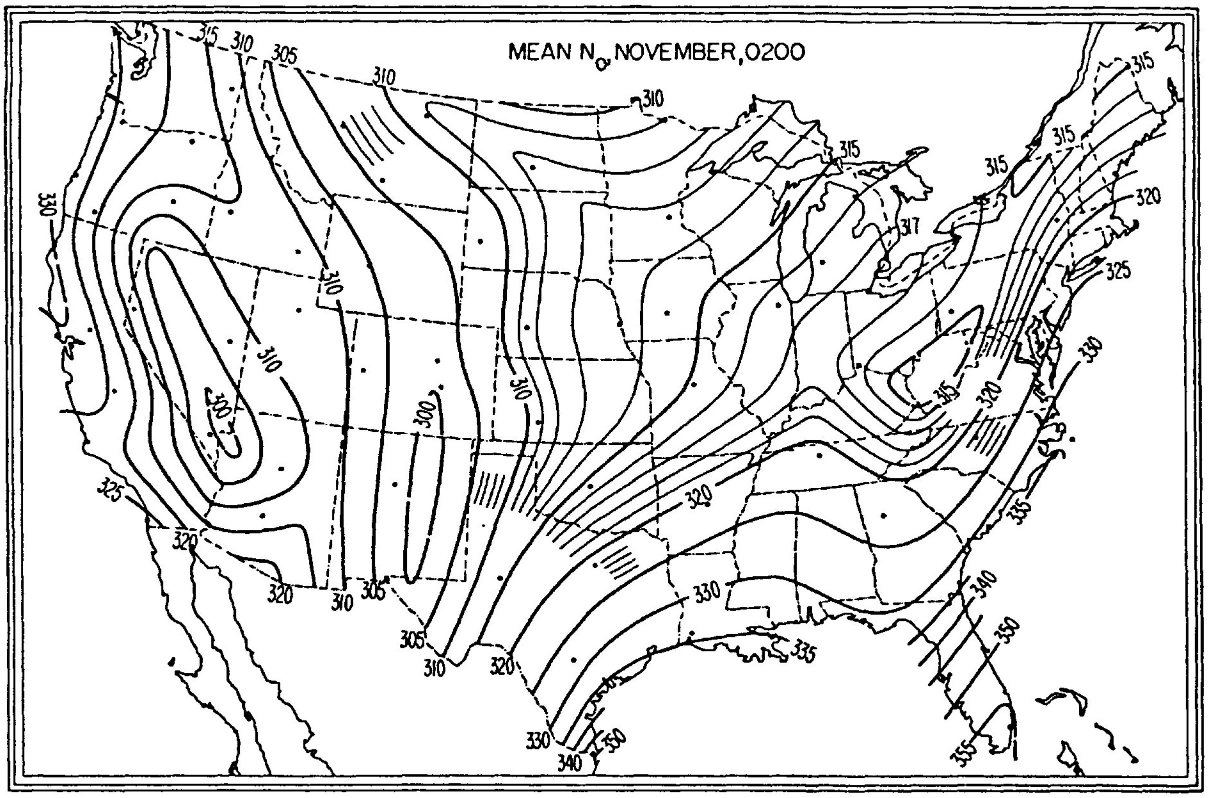

FIGURE 47. $\overline{N}_o$, *November, 0200 local time.*

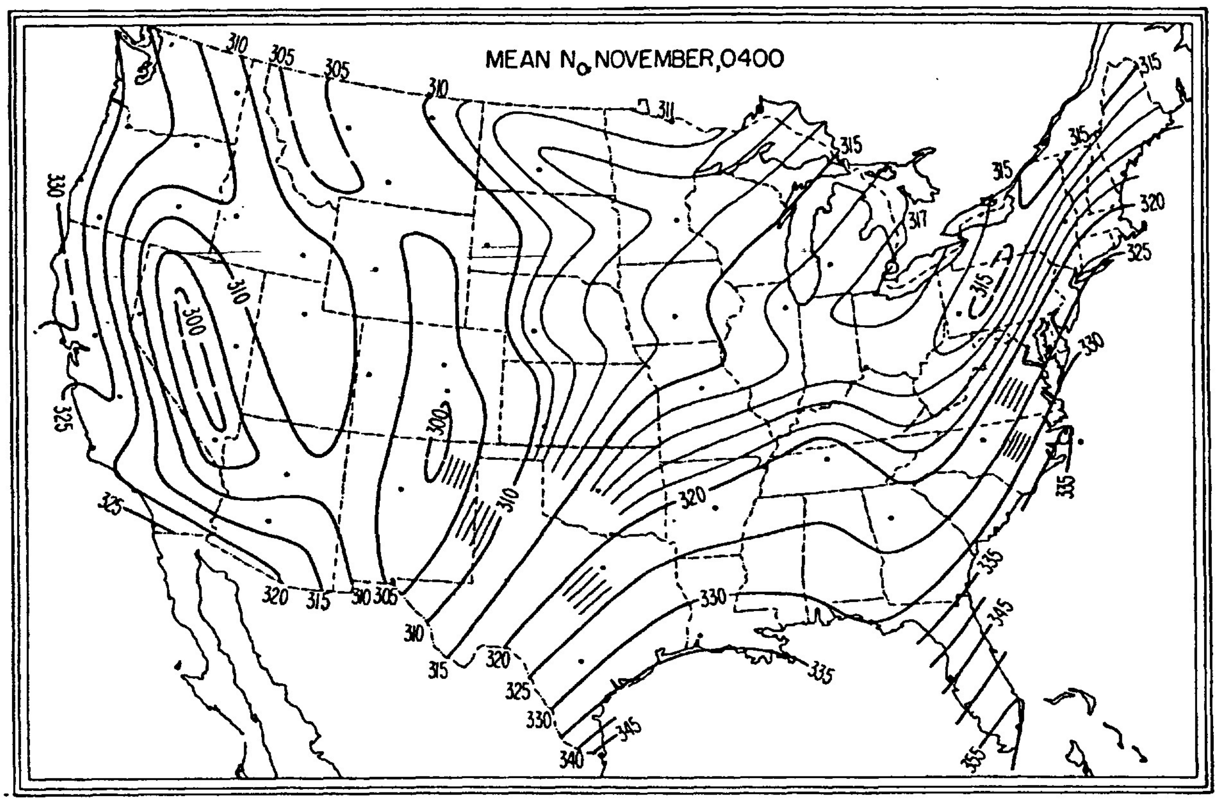

FIGURE 48. $\overline{N}_o$, *November, 0400 local time.*

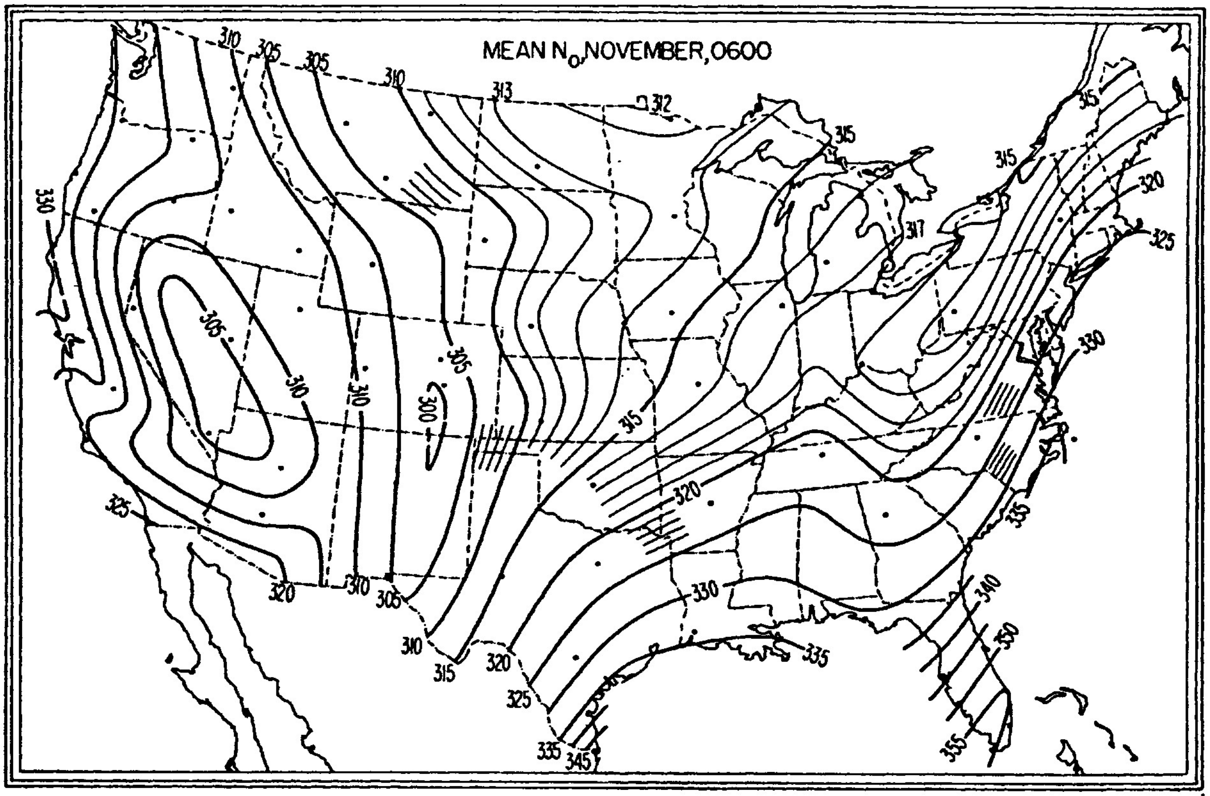

FIGURE 49. $\bar{N}_o$, *November, 0600 local time.*

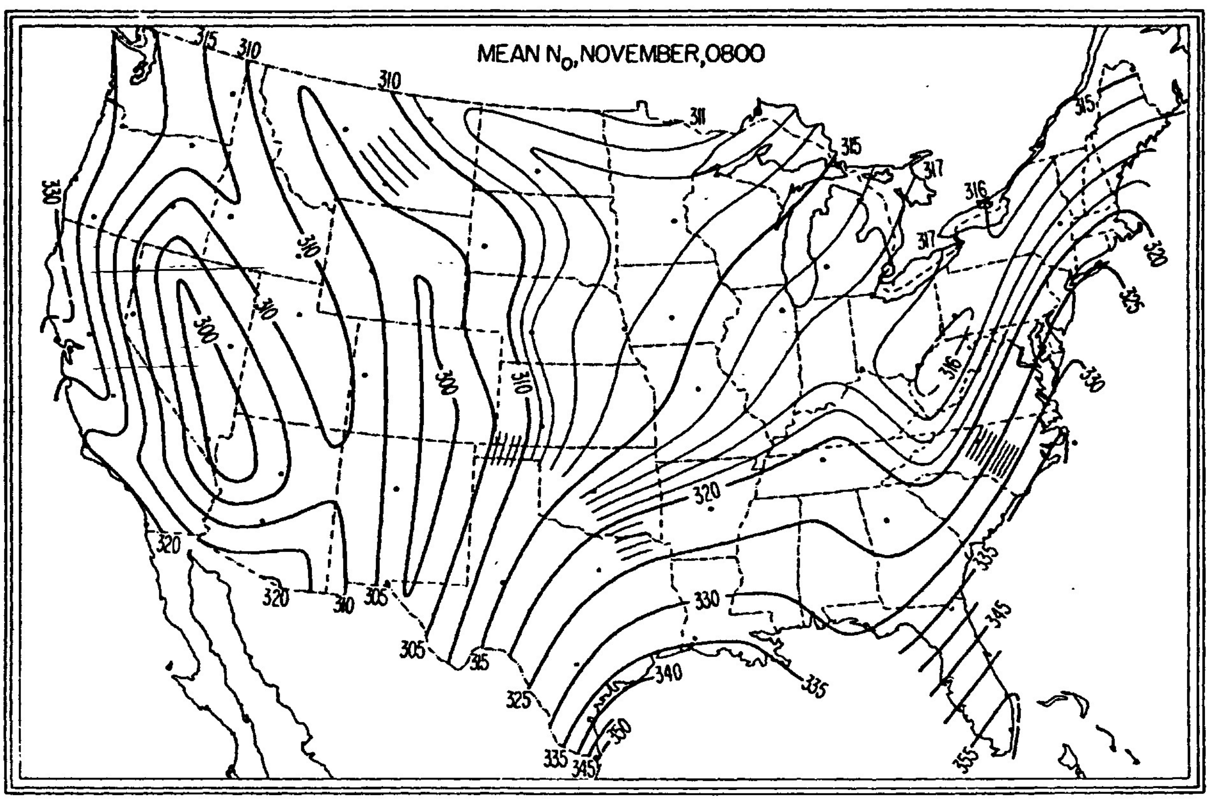

FIGURE 50. $\bar{N}_o$, *November, 0800 local time.*

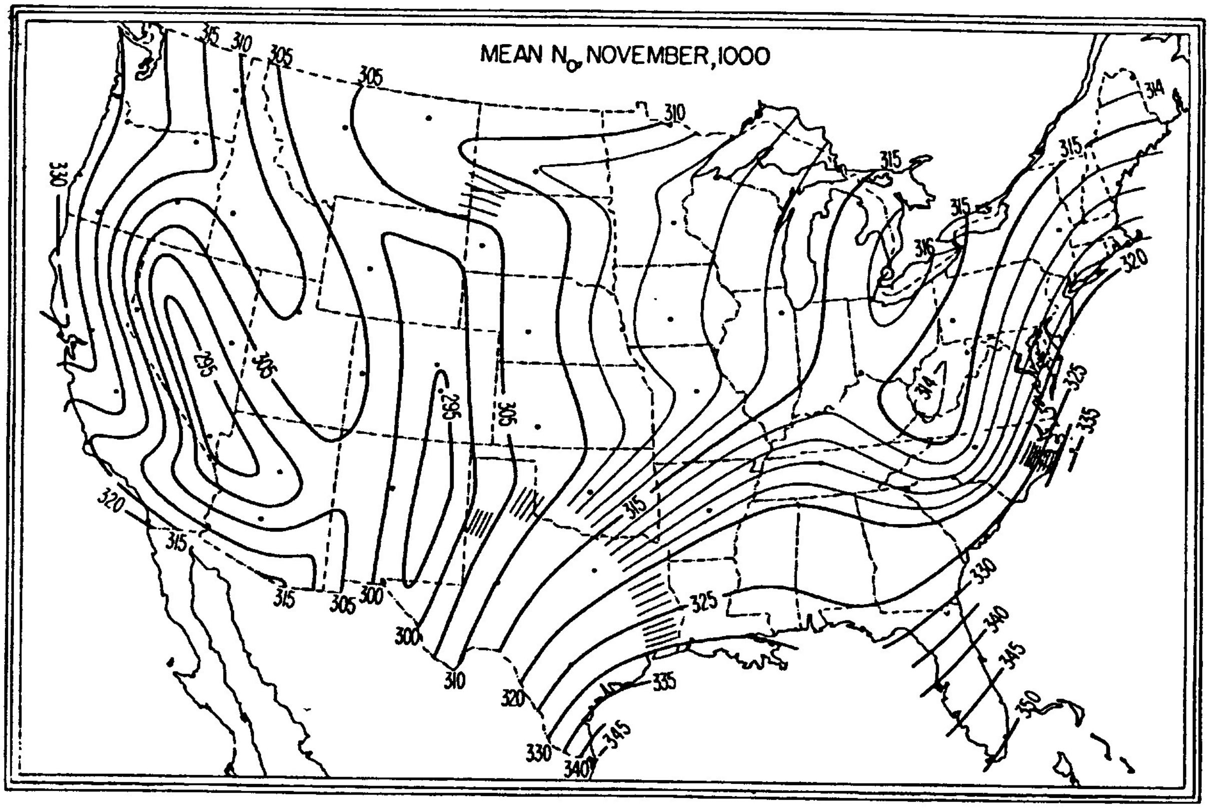

FIGURE 51. $\overline{N}_o$, *November, 1000 local time.*

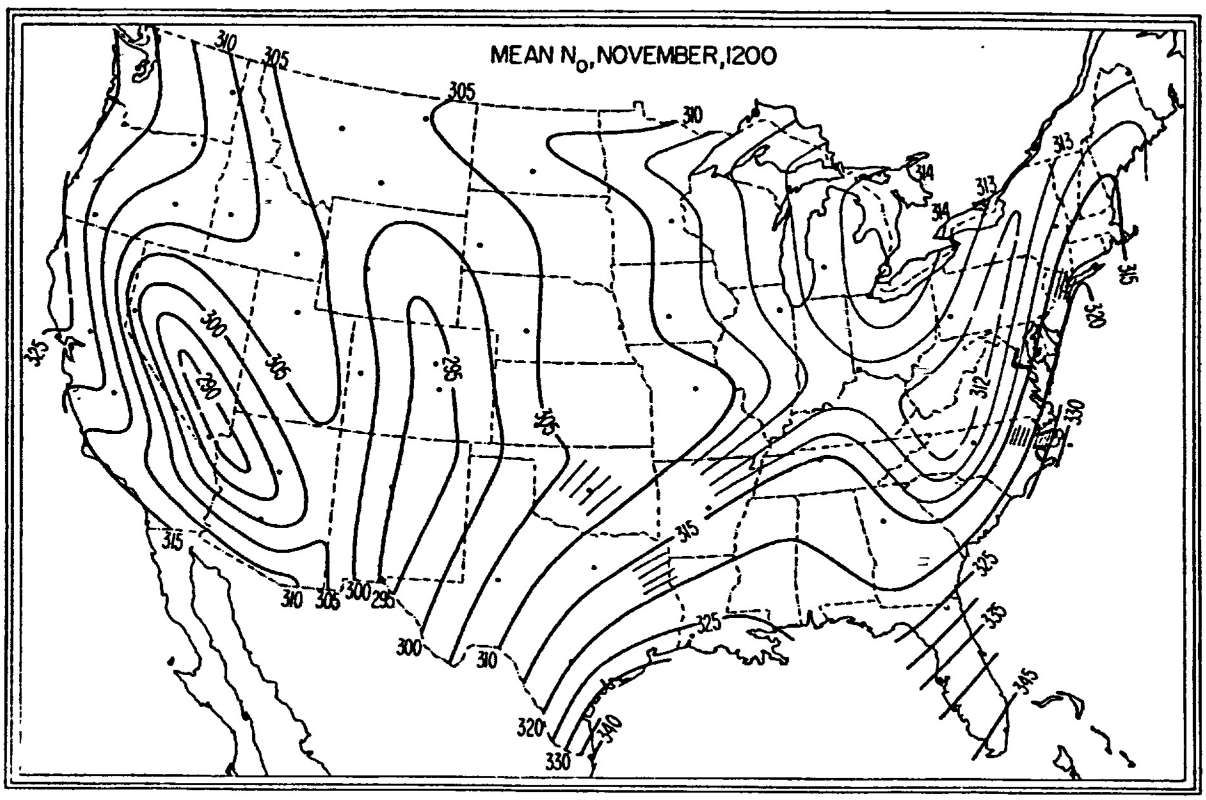

FIGURE 52. $\overline{N}_o$, *November, 1200 local time.*

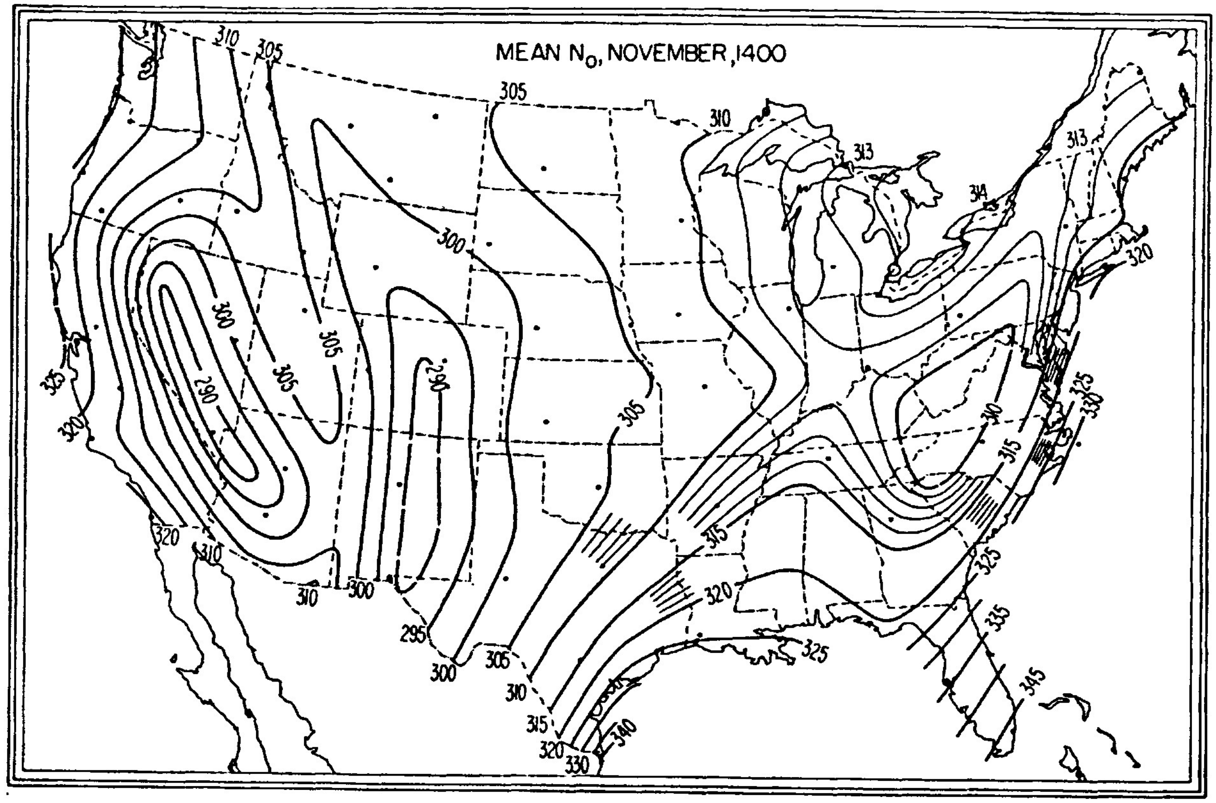

Figure 53. $\overline{N}_o$, *November, 1400 local time.*

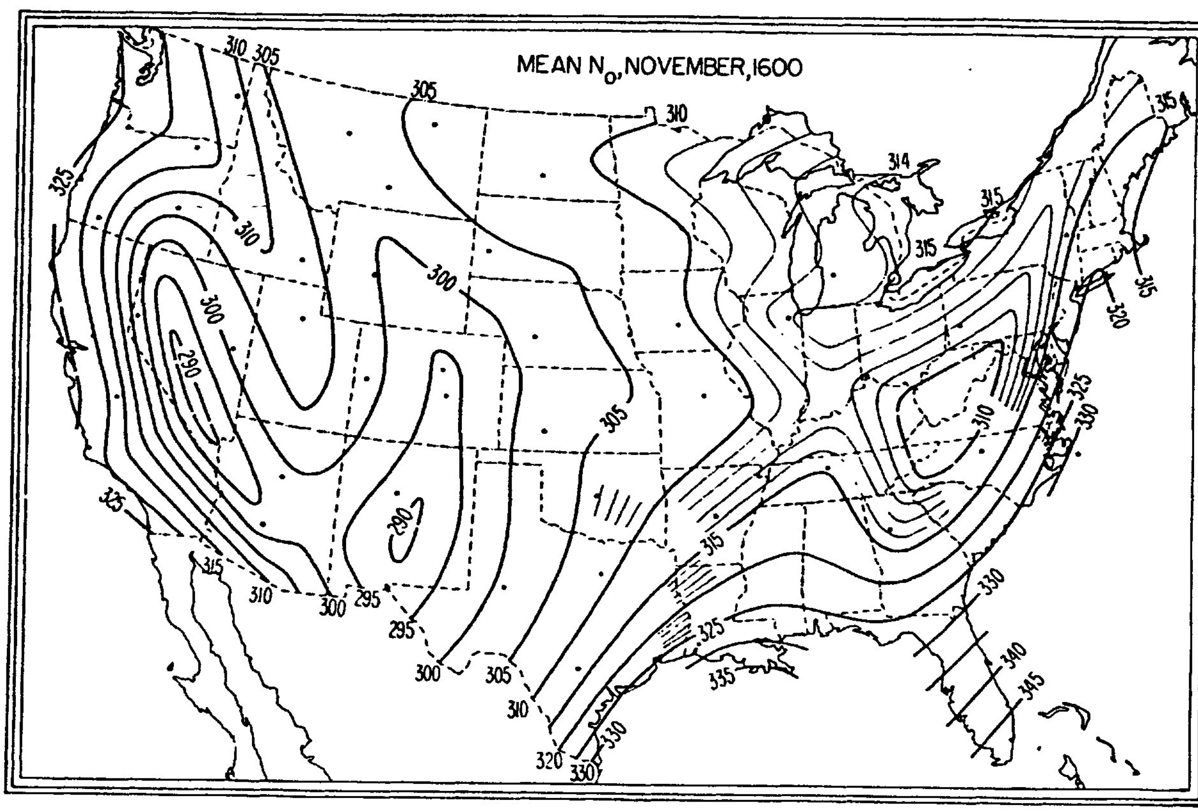

Figure 54. $\overline{N}_o$, *November, 1600 local time.*

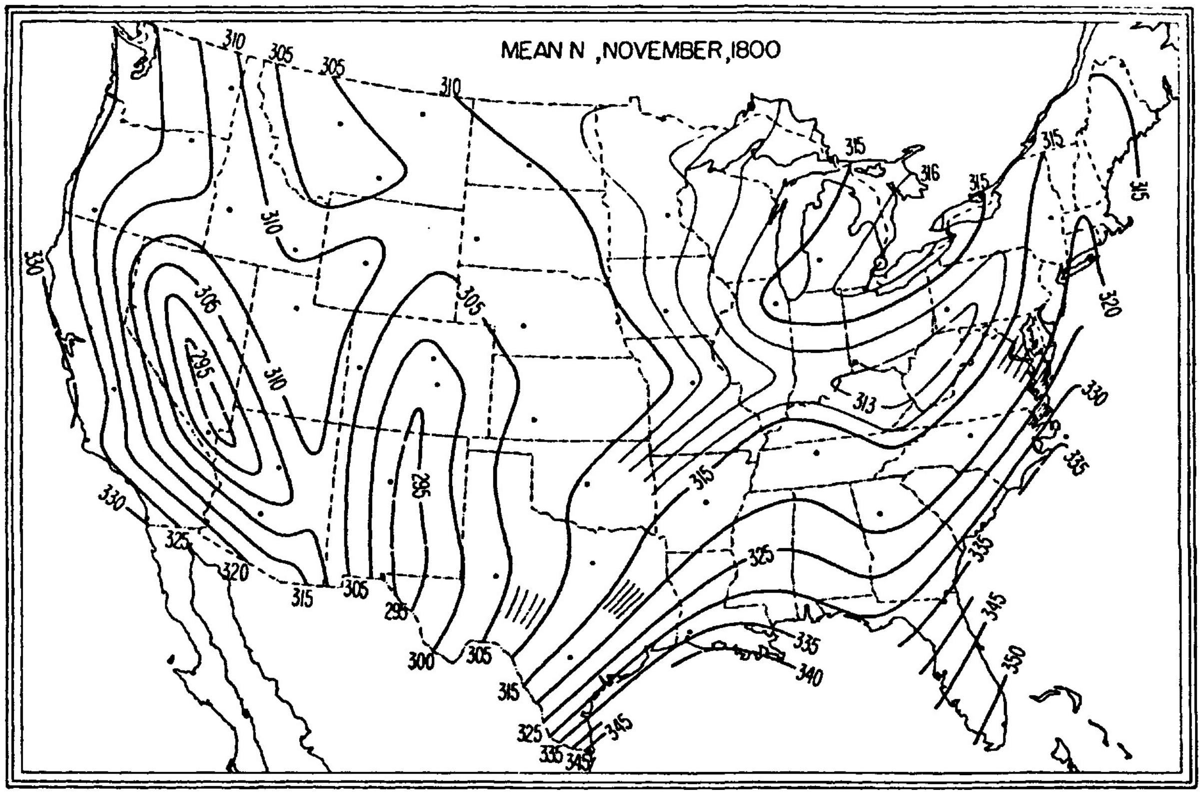

FIGURE 55. $\overline{N}_o$, *November, 1800 local time.*

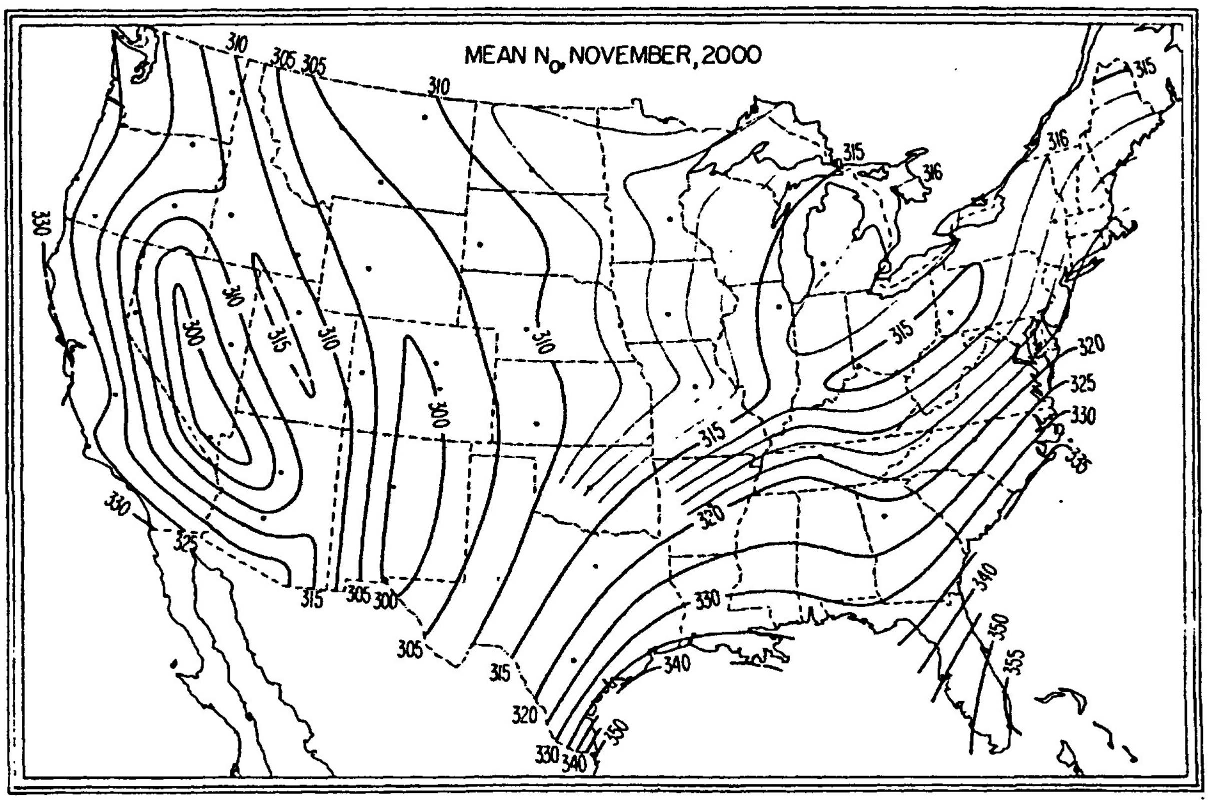

FIGURE 56. $\overline{N}_o$, *November, 2000 local time.*

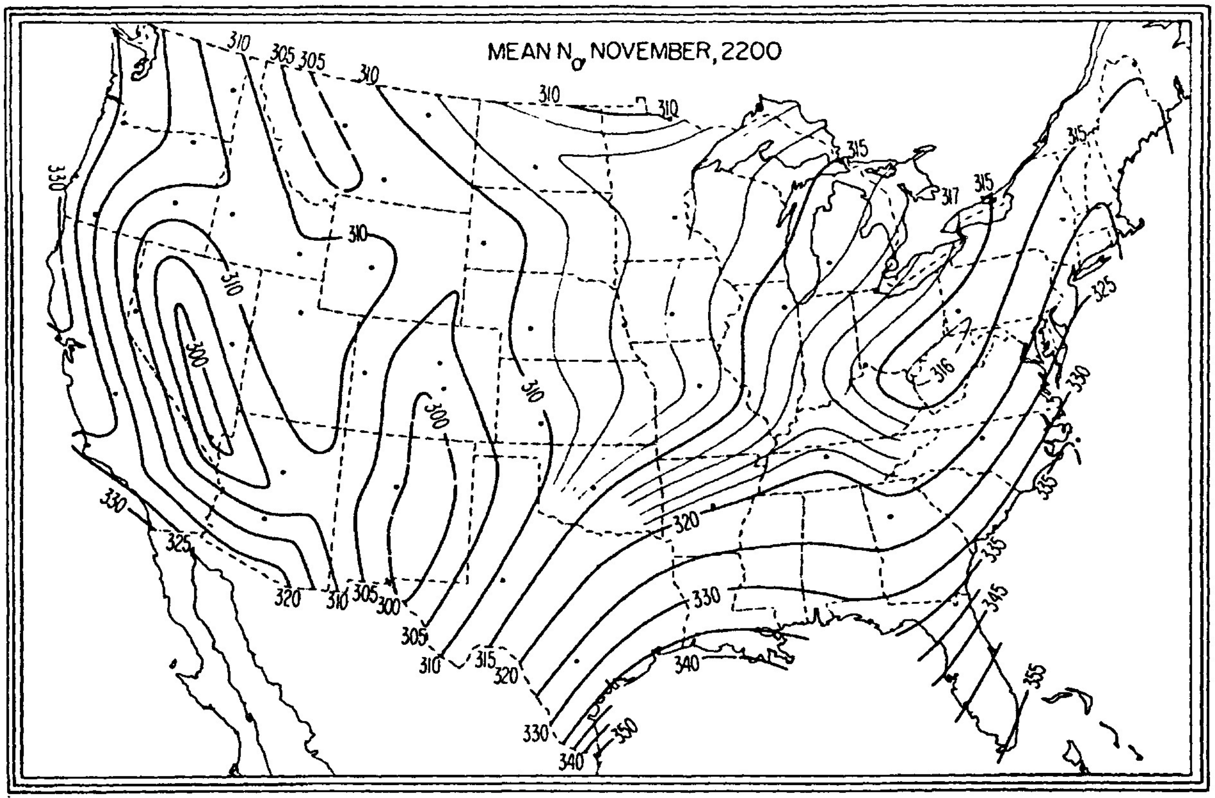

FIGURE 57. $\overline{N}_o$, *November, 2200 local time.*

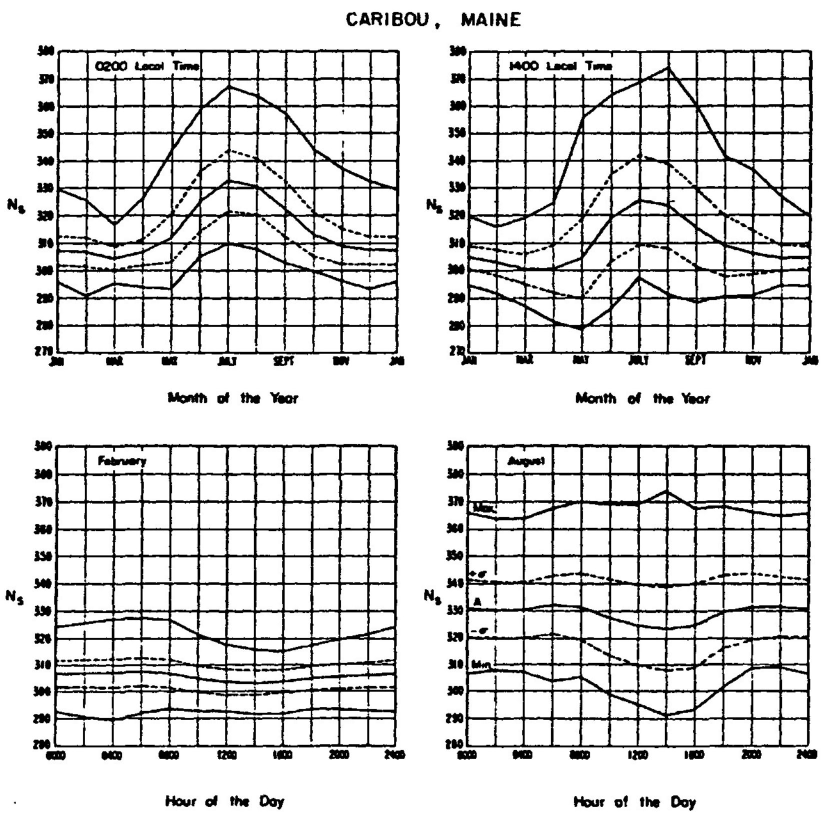

FIGURE 58. *Annual and diurnal cycles of* N_s*: Caribou, Me.*

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ılada en el suelo. Según
Rico es equivalente a una
), [redacted] los Grandes Llanos
ez[redacted]Aún una lluvia de 45"
ıerto Rico. Solamente en
e considerarse suficiente

[redacted]

42 pág. 53. [redacted]

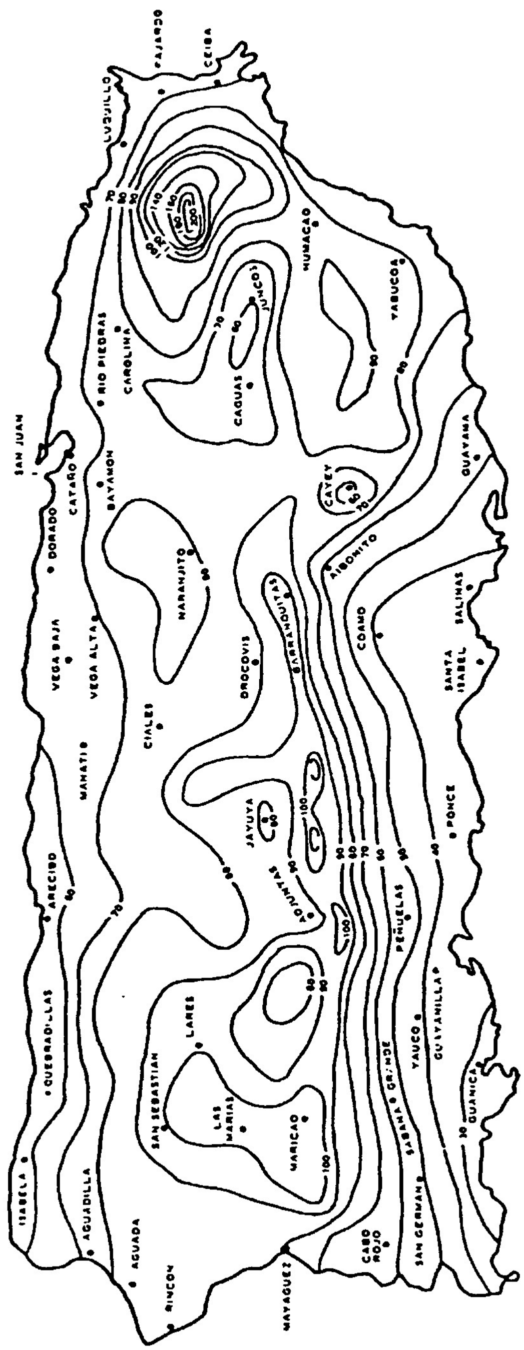

FIG. 68. Lluvia media anual (pulgadas). (Fuente de información: Autoridad de las Fuentes Fluviales.)

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