

NOAA Technical Memorandum NOS NGS-16



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DETERMINATION OF NORTH AMERICAN DATUM 1983  
COORDINATES OF MAP CORNERS (SECOND PREDICTION)

Rockville, Md.  
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National Geodetic Survey  
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UNITED STATES  
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NATIONAL OCEANIC AND  
ATMOSPHERIC ADMINISTRATION  
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ABSTRACT. A previous publication gave the predicted changes in coordinates of map corners which will occur after the 1983 readjustment of the North American geodetic networks is accomplished. These predictions are now revised on the basis of new data.

A previous publication\* announced predictions of changes in coordinates of map corners due to the readjustment of the North American Datum (NAD) which is scheduled for 1983. These predictions were based on the available data, of which the longitude origin of the Doppler NWL9D system was the most uncertain.

Recent investigations of Doppler scale and orientation involved comparisons of Doppler data with results obtained by radio-interferometric surveying (known as VLBI) and by astrometric methods. They indicate that the following corrections should be applied to Doppler NWL9D data:

scale correction: -0.38 ppm  
west longitude correction: -0.80" (i.e., the origin of  
Doppler longitude is shifted  
by 0.80" to the west.)

The ellipsoid parameters associated with the NWL10F system have been retained for the present predictions, i.e.,

equatorial radius: 6,378,135 m  
flattening: 1/298.26.

Contours of predicted changes in latitude, longitude, and geodetic height from NAD 1927 to NAD 1983 are shown in figures 1, 2, and 3. These results are based on comparisons of Doppler and NAD 1927 positions at 123 stations within the conterminous States and at 53 stations in Alaska.

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\*Vincenty, T., 1976: Determination of North American Datum 1983 coordinates of map corners, NOAA Technical Memorandum NOS NGS-6, 8 p.

The following mean shift values (corrected Doppler minus) NAD 1927) were obtained:

	<u><math>\Delta X</math></u>	<u><math>\Delta Y</math></u>	<u><math>\Delta Z</math></u>
<u>Conterminous United States</u>			
mean	- 9 m	154 m	178 m
spread	22	20	16
<u>Alaska</u>			
mean	-11	135	178
spread	31	42	22

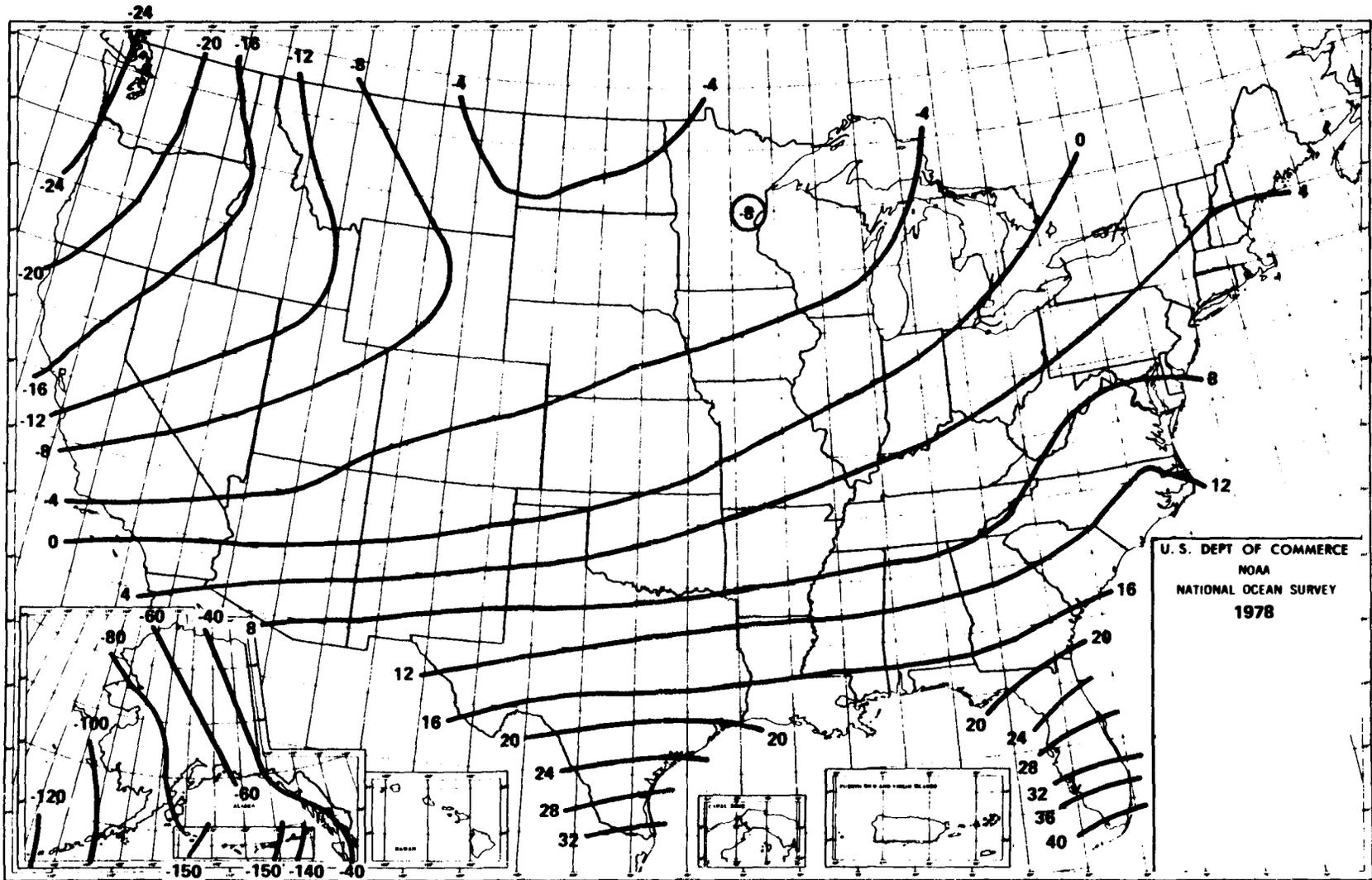


Figure 1.--Expected latitude change from NAD 27 to NAD 83 (in meters).

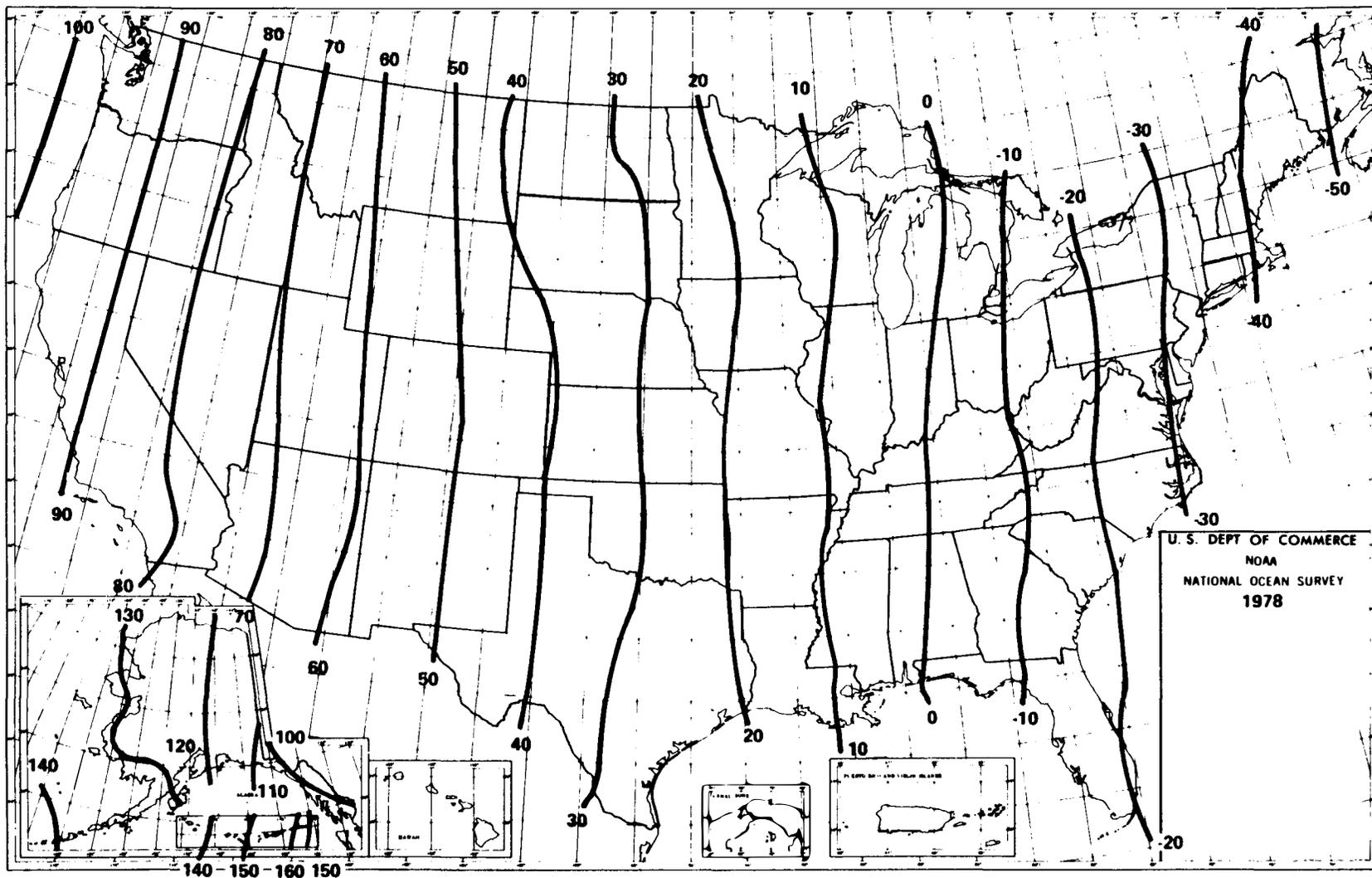


Figure 2.--Expected longitude change from NAD 27 to NAD 83 (in meters).

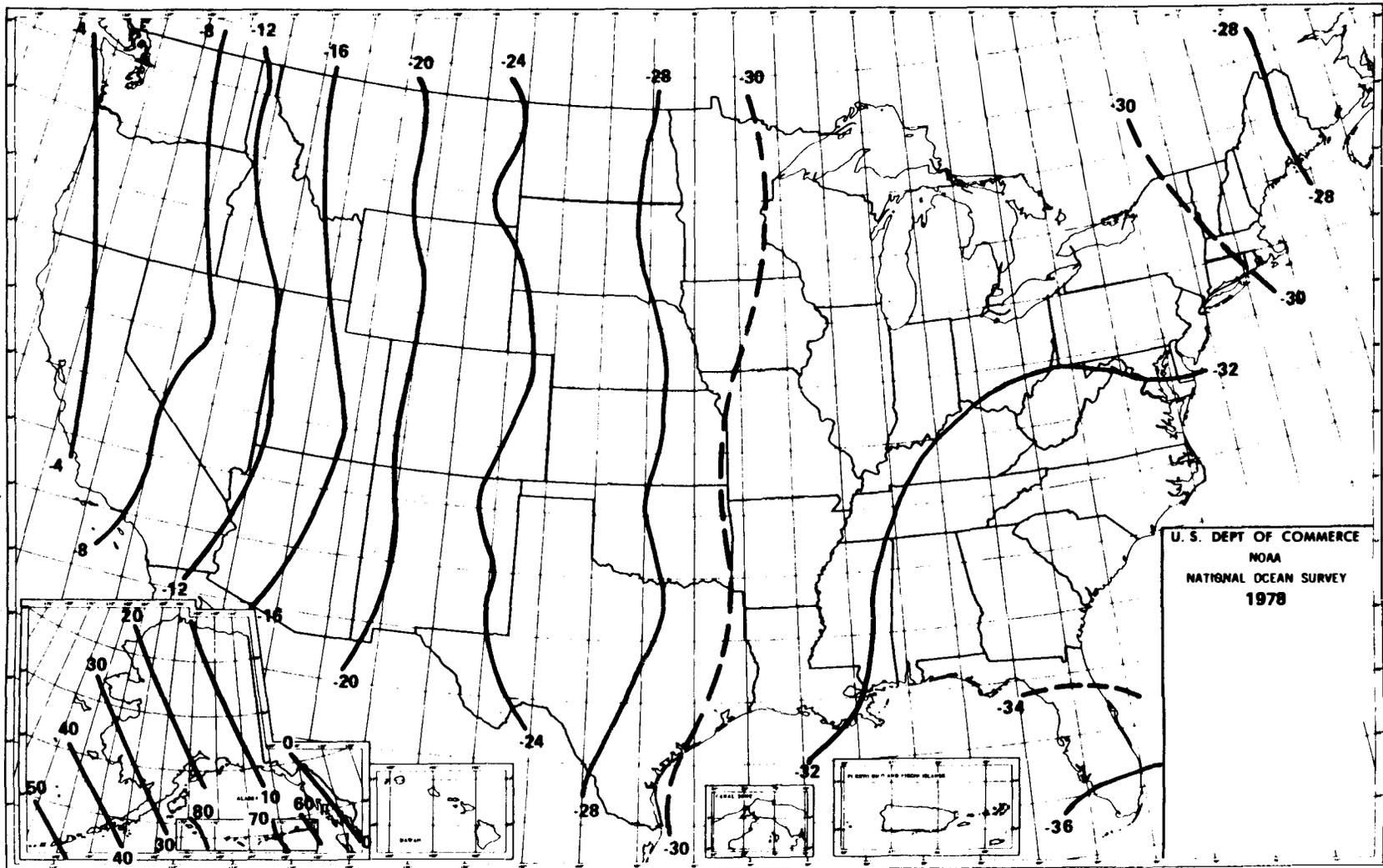


Figure 3.--Expected geoid height change from NAD 27 to NAD 83 (in meters).

