

for Lakes Michigan and Superior, but while the center of the disturbance passed directly over the Great Lakes, its energy was rapidly lost and no strong winds followed. The severe disturbance which covered the Rocky Mountain Region and the Great Plains on the 3d, 4th, and 5th acted in much the same manner as it approached the Lake Region, except that it took a more northerly course, and the storm warnings that were ordered were not justified.

Another storm which had been causing severe conditions throughout the West on the 11th and 12th, including heavy snow, gradually lost its energy in approaching the Great Lakes Region. Northeast storm warnings, however, that were ordered on the morning of the 12th for the southern half of Lake Michigan were justified at Chicago with an onshore wind of 37 miles.

Small-craft warnings were ordered on the morning of the 17th for eastern Lake Michigan and Lakes Huron, Erie, and Ontario, as a disturbance crossed the Great Lakes with its center far to the north, and verifying velocities were registered at a few stations. The strong winds, however, were accompanied by fair weather so that conditions were not in the least critical.

A storm which appeared in the northern Rocky Mountain region on the night of the 17th lost some of its energy as it approached the western Lake Region, but, nevertheless, warnings ordered for Lakes Superior, Michigan, and Huron were verified at a few stations.

While, as I stated before, nearly all of the storms lost their intensity as they reached the Great Lakes, there were two exceptions in the last decade of the month, one on the 23d and one on the 30th. The first of these two storms had no indication of increasing severity. Small-craft warnings were ordered on the morning of the 23d for all lakes except extreme western Superior, and these were changed to storm warnings at 1 p. m., verifying velocities being registered at a large majority of stations.

On the morning of the 28th an extensive barometric depression covered the Canadian Northwest, and on the 29th the head of this storm had reached the Lake Superior region, but a secondary disturbance was then developing over the Great Basin. The latter rapidly became the main disturbance and moved in a northeasterly direction its center passing over Lake Superior on the night of the 30th. Warnings were ordered on the 30th for all lakes except eastern Lake Superior, and at night they were lowered on the western portion of that lake because of the omission of an important word from the Duluth signals which indicated that the storm was rapidly losing force. As an unavoidable consequence of this and the fact that night reports are not received at Chicago from either Houghton, Mich., or Wausau, Wis., the two stations nearest to Duluth and in close proximity to the storm center, the warnings on Superior were not handled in the manner the situation demanded. This is a marked example of the necessity of accurate reports for use in forecasting. Moreover, generally speaking, from the standpoint of the forecaster, the work of handling the storm warnings on the Great Lakes during the whole month was most difficult because of the erratic action and movement of the various disturbances.

No general cold-wave warnings were issued during the month, and frost warnings for only a limited area in the extreme southeastern portion of the region, the latter terminating about the 15th, as there were no crops there after that date susceptible to injury.

Stock warnings were issued for the Dakotas on the 18th and on the morning of the 30th because of the threatening and severe conditions anticipated in con-

nection with the movement of the storms which passed northeastward toward Lake Superior.

Special advices for a week in advance have been sent from the beginning of the month to the Wenatchee Valley Traffic Association, Wenatchee, Wash., in connection with the shipment of fruit across the frontier States of the Northwest, and it has shown in various communications high appreciation of the service rendered.

The Chicago Weather Bureau office is making a special effort to get in even closer touch with the advertising interests in order to better guide these as to the time of publishing and the character of the ads. Many of the advertising managers of large establishments are in daily touch by telephone with the forecaster, and much appreciation has been shown of the service. The following letter received from the H. Paulman & Co. under date of November 23, which handles Pierce-Arrow motor cars and trucks, refers to an instance of such special service:

"We wish to thank you very much for the kind cooperation your department showed us last Saturday in advising us when you expected the first freeze.

"I do not know that we ever got so much consideration from a public department as we did from you, and, while I hope it will not be necessary to bother you again in the future, it would at least be a pleasure to do so."

—H. J. Cox.

#### NEW ORLEANS FORECAST DISTRICT.

The weather was exceptionally mild for the season, and frost warnings were continued longer than usual for the northern portion of the district. Colder weather during the last decade made frost warnings necessary in the interior of the southern portion, and warnings were issued accordingly. The frost warnings were verified except in a few instances characterized by persistent cloudiness.

On the 11th, with moderately low pressure over western Texas and high pressure over the northern and middle Rocky Mountain States, cold-wave warnings were issued at night for the Texas Panhandle and western Oklahoma. The warnings were extended the next morning over Oklahoma, northwestern Arkansas, and the northwestern and north-central portions of east Texas, a hard freeze being predicted for the northern portion of west Texas; and the warnings were given to stockmen. The cold wave occurred over part of the northwestern portion of the district, but was prevented from extending farther by the northward movement of the LOW, a trough of low pressure being maintained over the central portion of the country for two days, while the western HIGH became less intense and pressure increased over the Great Lakes. No other cold-wave warnings were issued or required.

Northwest storm warnings were displayed on the Texas coast because of conditions shown on the 8 p. m. map of the 12th, but were only partially verified, as the area of high pressure diminished greatly in intensity as it moved southward.

Small-craft warnings were displayed on the middle coast of Texas on the 22d and locally by the official in charge at Corpus Christi, Tex., on the 4th, 21st, and 30th. These warnings were justified.

Fire-weather warnings for forested areas in Arkansas and Oklahoma were issued on the 4th and 30th.—*R. A. Dyke.*

#### DENVER FORECAST DISTRICT.

A LOW which began to develop on the southern Rocky Mountain Plateau on the 1st had moved by the evening of the 3d to northern New Mexico, whence it advanced