

For purpose of comparison, there is submitted Table 3, showing the stages of all the recorded flood crests at Portland, Oreg., due to the annual rise in the Columbia River.

THE 1907 ANNUAL RISE IN THE COLUMBIA RIVER.

Mr. E. A. Beals, district forecaster, submits under date of August 26, 1908, the following corrections to his report on the 1907 annual rise in the Columbia River, as published in the MONTHLY WEATHER REVIEW for July, 1907, XXXV, page 305:

For Table 1, substitute the following table:

Northern Plateau.—Temperature and rainfall.

| | Temperature. | | Rainfall. | |
|---------------|--------------|------------|-----------|------------|
| | Mean. | Departure. | Average. | Departure. |
| 1906. | | | | |
| November..... | 36.0 | -0.9 | 1.91 | +0.5 |
| December..... | 35.9 | +3.6 | 2.54 | +0.7 |
| 1907. | | | | |
| January..... | 24.4 | -2.3 | 1.91 | -0.1 |
| February..... | 35.4 | +6.9 | 1.84 | +0.2 |
| March..... | 41.3 | +1.1 | 2.22 | +0.5 |
| | 35.2 | +1.7 | 10.42 | +1.8 |

In the second paragraph of the first column of page 305, change the second word from "total" to "average." Change the third and fourth paragraphs of the same column to read as follows:

"It will be seen by this table that last year during the period of snowfall there was 1.8 inches excess in precipitation, and an excess of 1.7° in temperature. Reports gathered at the end of March from snowfall reporters in western Montana, British Columbia, Idaho, and northwestern Wyoming, were to the effect that there was more than the average amount of snow on the ground at that time, and if the amount of snow in the mountains is a gage for the height of the subsequent flood crest, then unusually high water was to be expected later on."

"The mean temperature in the northern Plateau during April and May, 1907, was nearly normal, being only 0.8° below normal in April and 0.9° above normal in May. Also during these months there were no unusual or protracted hot spells, but, instead, the variations from day to day were quite small and uniform."

STORMS AND ICE ON THE GREAT LAKES.

By NORMAN B. CONGER. Dated Detroit, Mich., July 11, 1908.

THE DISPLAY OF STORM WARNINGS ON THE GREAT LAKES.

The storm-warning flags adopted by the Weather Bureau for announcing the approach of wind-storms are as follows:

The storm warning (a red flag 8 feet square, with black center 3 feet square) indicates that the storm is expected to be of marked violence.

The red pennant (8 feet hoist and 15 feet fly) displayed with flags indicates easterly winds; that is, from northeast to south, inclusive, and that the storm center is approaching.

The white pennant (8 feet hoist and 15 feet fly) displayed with flags indicates westerly winds; that is, from north to southwest, inclusive, and that the storm center has past.

When the red pennant is hoisted *above* the storm-warning flag, winds are expected from the northeast quadrant; when *below*, from the southeast quadrant.

When the white pennant is hoisted *above* the storm-warning flag, winds are expected from the northwest quadrant; when *below*, from the southwest quadrant.

Night storm warnings.—By night a red light will indicate easterly winds; a white light *below* a red light will indicate westerly winds.

The hurricane warning (two storm-warning flags, red with black centers, displayed one above the other) indicates the expected approach of tropical hurricanes, and also of those

extremely severe and dangerous storms which occasionally move across the Lakes and the northern Atlantic coast.

When orders to hoist this warning are received at any Weather Bureau station, every effort will be made by the officials and employees of the service to give the warnings the widest possible distribution, and all vessels will be notified that it is dangerous to leave port.

The regular Weather Bureau stations on or near the Great Lakes are designated by small capitals in the following lists. They are:

Lake Superior.—Duluth, Minn.; Houghton and Marquette, Mich.

St. Marys River.—Sault Sainte Marie, Mich.

Lake Michigan.—Green Bay and Milwaukee, Wis.; Chicago, Ill.; Escanaba and Grand Haven, Mich.

Lake Huron.—Alpena and Port Huron, Mich.

Detroit River.—Detroit, Mich.

Lake Erie.—Toledo, Sandusky, and Cleveland, Ohio; Erie, Pa.; and Buffalo, N. Y.

Lake Ontario.—Rochester and Oswego, N. Y.

Storm and hurricane warnings are displayed at all regular Weather Bureau stations, and at a number of smaller ports, designated as storm-warning stations, in charge of displaymen, who hoist the warnings and post and distribute the bulletins, giving information of the storms on the Great Lakes.

At all lake stations, except Port Huron, Mich., a chart is issued daily, except Sundays, showing the weather conditions at 8 a. m., seventy-fifth meridian time (7 a. m., Central time), over the region of the Great Lakes and to the westward. Port Huron, Mich., is supplied with charts from Detroit. Vessel masters are cordially invited to call at any of the Weather Bureau offices for these charts or any other information they may desire in connection with the weather. The official in charge of the Weather Bureau office at Detroit, Mich., has been instructed to furnish a copy of all storm warnings, in addition to the weather maps, for use of vessel masters passing Detroit. Arrangements have been made with the Post-Office Department whereby these warnings and weather maps will be delivered to the masters by the mail boat. In case the mail boat does not have mail for each boat and the master desires information of the latest weather conditions, the following code of signals promulgated by the postmaster at Detroit may be used:

Signal to passing boats from United States mail boat for delivery of mail: (Blasts) one long (————); one short (—); one long (————).

Signal to steam vessels wanting mail boat to call for mail: (Blasts) one long (————); one short (—): one long (————).

Signals for sailing vessels requiring mail boat: White flag by day. Flashing bright light at night.

Signal from mail boat to large boat to check down: Three blasts from mocking-bird whistle.

Signal from rowboat belonging to mail boat when approaching vessels for delivery of mail: White flag in daytime. Swing-bright bright light at night.

For ordinary storm warnings the mail boat will display a red flag with a black square center; and for warnings of severe or dangerous storms, two flags, red with black square centers. In the latter case the mail boat will deliver storm warnings to *all boats bound down*.

The Kendall Reporting Agency, at Port Huron, Mich., will deliver storm warnings to boats *passing into Lake Huron*.

Storm-warning displaymen at stations on the Great Lakes are authorized to telegraph for information regarding expected weather conditions in their vicinity whenever such information is requested by masters flying the American flag. From stations on Lake Superior, Michigan, or Huron these requests will be address to the Weather Bureau office, Chicago; from

stations on Lake Erie or Ontario to the Weather Bureau office, Buffalo.

Masters of vessels of this class, whenever at a port on the Great Lakes where there is no Weather Bureau office or storm-warning station, may themselves telegraph for this information, observing the same rule as to territory as given above.

The telegram should be address: "Weather, Chicago," or "Weather, Buffalo."

These messages and the answers thereto will be at Government expense, but it is expected that the privilege thus granted will only be exercised when the information sought is regarded as necessary for the safety of the vessels concerned.

It is also expected that vessel masters who avail themselves of this privilege will make public the information obtained for the benefit of all vessels in their vicinity.

LIST OF STATIONS AND LOCATION OF FLAGSTAFFS AND TOWERS.¹

LAKE SUPERIOR.

Ashland, Wis.—J. G. Upthegrove.

Steel tower: Bay front, foot of Second avenue, W., near junction with Front street. Electric lights.

Bayfield, Wis.—William Miller.

Steel tower: Sixty-five feet from water's edge, facing First street; 120 feet from intersection with Front avenue. Electric lights.

Deer Park, Mich., life-saving station.—Sara E. McGaw.

Flagstaff: Deer Park Life-saving station, near mouth of Sucker River.

DULUTH, MINN.—W. H. Richardson, local forecaster.

Displays: Flags and electric lights.

Steel tower: Southwest side of Weather Bureau Building, Seventh avenue, W., and Eighth street.

Flags: Post-office Building, First street and Fifth avenue, West Duluth. Evening Telegraph Building, 1017 Tower avenue, West Superior.

Eagle Harbor, Mich.—Alice Nolen.

Steel tower: On light-house reservation.

Grand Marais, Mich.—Mrs. Lena Truedell.

Steel tower: On Life-Saving Service reservation. Electric lights.

HOUGHTON, MICH.—Abe Wiesner, observer.

Steel tower: On roof of Weather Bureau office, Sheldon Building. Electric lights.

MARQUETTE, MICH.—H. R. Patrick, observer.

Steel Tower: Marquette County Savings Bank Building, southeast corner of Washington and Third streets. Electric lights.

Munising, Mich.—A. C. Hortho.

Steel tower: In Beach Inn yard, just east of Beach Inn.

Ontonagon, Mich.—A. S. Follansbee.

Flagstaff: On Court House lawn.

Pequaming, Mich.—Charles Hebard & Son.

Flagstaff: Two hundred feet north of Hebard & Son's saw-mill.

Ship Canal, Mich., life-saving station.—Mrs. C. E. McCormick.

Steel Tower: At Lake Superior end of ship canal.

SAULT SAINTE MARIE, MICH.—Alexander G. Burns, observer.

Flagstaff: Weather Bureau Building. Electric lights.

Weather maps and storm-warning messages are placed in the canal office for masters of boats passing the canal, also with the superintendent of the Canadian Soo Canal. Barometers adjusted.

Superior, Wis.—E. A. Ostergren.

Steel tower: On outer end of Dock No. 2.

Two Harbors, Minn.—G. W. Watts.

Steel tower: At Ore Dock No. 2 and flagstaff at store of J. Schreiner & Co., corner of Poplar street and First avenue. Electric lights.

Washburn, Wis.—Joseph A. McI tree.

Steel tower: On bay front. Electric lights.

Whitefish Point, Mich.—Mrs. Annie M. Carlson.

Steel tower: On light-house reservation, 667 feet east-northeast from tower, 31 feet north-northeast from fog warning No. 1.

LAKE MICHIGAN.

Beaver Island (St. James), Mich.—James McCann.

Steel tower: Church Hill.

Big Point Sable, Mich.—Mrs. Mary Lysaght.

Steel tower: On Life-Saving Service reservation, about 8½ miles from Ludington Harbor.

Charlevoix, Mich.—Miss Florence M. Smith.

Steel tower: On bluff, south side of harbor entrance.

CHICAGO, ILL.—Prof. Henry J. Cox, Weather Bureau, Federal Building.

Steel tower: On South Breakwater, near life-saving station, Chicago Harbor, Ill.

Steel tower: On southwest corner of Life-Saving Service reservation, South Chicago. Electric lights.

Church Hill, Beaver Island, Mich.—Norbert Wilhelm.

Steel tower: On Church Hill, about 1½ miles south of St. James, Beaver Island. Oil lights.

ESCANABA, MICH.—H. S. Cole, observer.

Steel tower: On roof of office building, 813 Ludington street. Electric lights.

Frankfort, Mich.—Miss Amelia Morency.

Steel tower: Life-saving station. Electric lights.

Flagstone, Mich.—Paul B. Hammond.

Flagstaff: Top of elevator at docks, "Soo Ry." Electric lights.

Glen Haven, Mich.—Eva E. Day.

Steel tower: West end of Day's pier.

GRAND HAVEN, MICH.—C. H. Eshleman, observer.

Steel tower: Cutler House, corner Third and Washington streets. Electric lights.

GREEN BAY, WIS.—F. W. Conrad, observer.

Steel tower: On roof of Weather Bureau office, Parmentier Block, 324 to 328 Washington street. Electric lights.

Harbor Springs, Mich.—V. A. Pool.

Steel tower: Foot of Spring street, on the bluff.

Holland, Mich.—Mrs. Madalen A. Van Putten.

Flagstaff: Life-saving station, Macatawa Beach.

Kenosha, Wis.—J. C. McNally.

Steel tower: Near steamboat landing. Electric lights.

Kewaunee, Wis.—John Dishmaker.

Flagstaff: Near harbor, close to telegraph office.

Ludington, Mich.—J. O. Ellison.

Steel tower: Near Life-Saving Service station. Electric lights.

Macatawa, Mich.—Mrs. Jennie Van Weelden.

Flagstaff: In front of life-saving station.

Mackinaw, Mich.—Chas. T. Dagwell.

Steel tower: On grounds of the Lake Marine News Association. Electric lights.

Manistee, Mich.—F. V. Davis.

Steel tower: Corner Pine and Second streets. Electric lights. Life-saving station, north side of entrance to harbor.

Tower on west side of reservation. Oil lights.

Manitowoc, Wis.—T. C. Torrison.

Steel tower: On river front, two blocks from lake. Electric lights.

Menominee, Mich.—L. C. Collins.

Flagstaff: No. 1 engine house. Electric lights.

Michigan City, Ind.—Josephine R. Robb.

Steel tower: At north end of Franklin Street Bridge. Electric lights.

MILWAUKEE, WIS.—Henry B. Hersey, Inspector, Weather Bureau.

¹ This list has been revised to July 1, 1908.