

INSTRUCTIONS FOR WS FORM B-91

TAKING AND RECORDING OBSERVATIONS

- 2 -

1. FILLING IN THE TOP AND BOTTOM OF WS FORM B-91. Begin a new form on the first of every month by filling in the heading and bottom of the form completely. Most entries are self-evident. Enter in the space marked "TYPE OF RIVER GAGE" the word "wire-weight," "staff," "slope," "float tape," "recorder chart," "distance indicator" or other type in use. In the space marked "STANDARD TIME IN USE," enter one of the following: E (Eastern), C (Central), M (Mountain), P (Pacific), AH (Alaska-Hawaii) or the appropriate longitude time zone number (e.g., 150th). If using daylight saving time, precede the time zone letter with "D" (e.g., DE - Daylight Eastern).

The temperature at the time of observation for the last day of the preceding month should be entered in the space beneath the words "AT OBSN.", which is just above the space for entering the temperature at the time of observation for the first day of the month (95 is entered there in the example on the other side of this cover page). Similarly, in the next column to the right, precipitation beginnings and endings for the last day of the preceding month should be entered in the same manner (a wavy line is entered 8-11 p.m. in the example). CHECK BAR READINGS for the LAST DAY of the PRECEDING MONTH should be entered in the proper space at the bottom of the form if a wire-weight gage is used (22.10 is entered in the example).

Enter your name, station index number, and supervising office on the bottom of the form.

2. MAKING YOUR DAILY ENTRIES. The sample form shows how entries should be made at stations taking river, precipitation, and temperature observations. Entries for each day should be on the corresponding date line of the date of observation except as indicated under "Special Observations" and "Remarks." AN ADDITIONAL FORM B-91 WILL BE USED IF MORE SPACE IS NEEDED as it is undesirable to have entries on the reverse side.

3. WHEN TO TAKE OBSERVATIONS. Take your observations at the same hour each day, if at all possible. Prior approval is needed to change the scheduled time of observation. Routine River and/or Rainfall observations should ALWAYS be taken in the MORNING, preferably at 7 a.m. Temperature observations should be taken as late in the day as is convenient after 5 p.m. At climatological stations, however, precipitation should be measured at the same time the temperature readings are made (preferably after 5 p.m.). The times of observation should be entered in the third line of the heading and at the top of the river stage column. When the regular observation cannot be made within an hour of the scheduled time, an entry should be made in the first column to the right of the "WEATHER" columns (marked "time of observation if different from above," showing the exact time of the observation. If the time entry in this column applies only to precipitation, it should be encircled.

4. SUBSTITUTE OBSERVERS. Continuity of your records is very important. A member of your family, or some other competent person, should be taught to take and record observations in the event of your absence or illness.

5. USE OF WS FORMS B-82 AND E-14. You may use WS Form B-82, "Official Weather Observer's Record," to record the observations as you take them. Enter river stages under "Remarks and Notes" if you use WS Form B-82. If using this form, copy the data promptly onto Form B-91. You may retain Form B-82.

6. OTHER INSTRUCTIONS. Additional instructions are found in Observing Handbook No. 2, "Cooperative Station Observations" and other publications. Please refer to these frequently, especially at the beginning of the snow season. Also feel free to ask your cooperative program manager for information at any time.

7. TEMPERATURE (°F). The maximum (MAX.) and minimum (MIN.) temperatures are the highest and lowest temperatures to have occurred during the past 24 hours. The AT OBSN temperature is the temperature at the time you take your observation. Enter to the nearest whole degree.

The minimum must be at least as low as the lowest of yesterday's and today's AT OBSN temperatures, and the MAX must be at least as high as the highest of today's and yesterday's AT OBSN temperatures. For example, if yesterday's AT OBSN temperature was 95, today's maximum must be at least as high as 95, even if the maximum this calendar day was only 86. You may record the 86° maximum in the REMARKS (far right) column as "PM MAX 86," as shown on the sample page [inside front cover] on the first day of the month. This is optional. See the REMARKS column on the sample page for the 23d of the month for recording last night's minimum (23), when it was warmer than yesterday's AT OB temperature (11).

7(a). MAXIMUM AND MINIMUM TEMPERATURE OBSERVATIONS — MAXIMUM-MINIMUM TEMPERATURE SYSTEM (MMTS). If you have liquid-in-glass thermometers, please see paragraph 7(b). If you have the MMTS, obtain the maximum and minimum temperatures by pressing the buttons marked "MAX" and "MIN", respectively. Record these readings, as well as the current temperature, to the nearest whole

degree. The current temperature is the reading shown when no buttons are depressed. If the reading to the right of the decimal is 5 or greater, round off to the higher figure; i.e., 39.5 should be recorded as 40. After recording these values on your form, press the "RESET" and "MAX" buttons simultaneously, then do the same with the "RESET" and "MIN" buttons. You can check to be certain the readings reset properly by pressing the "MAX," then the "MIN" buttons. They should read the same as the current temperature.

WHAT TO DO WHEN THE MMTS DISPLAYS "HELP." If the display reads "HELP," there has been an interruption in the power supply. To restore the MMTS current temperature reading, press the reset button only. You may still obtain maximum and minimum temperatures by pressing the appropriate buttons. However, if the power was off during an extended period, including the time the highest or lowest temperature occurred, the readings shown may not be the highest and lowest. If you believe this is so, you may write "Power failure during time of max (or min) temperature" in the "REMARKS AND NOTES" area of your observation form.

7(b). LIQUID-IN-GLASS MAXIMUM AND MINIMUM TEMPERATURES.

MINIMUM TEMPERATURE. The MINIMUM thermometer should be read FIRST so that the index in the minimum thermometer will not be jarred or disturbed in any manner before the reading is made. It should be read while in its nearly horizontal or "set" position by reading the temperature scale at the end of the small index farthest from the bulb (the right hand side as you look at it). Do not reset the MINIMUM thermometer until the maximum thermometer has been read and reset. Reset the minimum thermometer by raising the bulb end sufficiently to allow the small index to slide to the end of the alcohol column, and then lowering the thermometer to its nearly horizontal position.

MAXIMUM TEMPERATURE. Lower the maximum thermometer slowly to a vertical position, with the bulb end down. Then, read the maximum temperature from the top of the mercury column. To reset it, whirl it clockwise several times until the reading is approximately the same as shown on the minimum thermometer. Next, return it to its nearly horizontal position with the bulb end slightly elevated. NOTIFY THE SUPERVISING OFFICE if the maximum and minimum temperatures disagree by more than one degree after setting.

TEMPERATURE AT TIME OF OBSERVATION. This should be obtained by reading the maximum thermometer after it has been whirled and while it is still in a vertical position. The current temperature may be determined at other times of day by reading the end of the alcohol column of the minimum thermometer without disturbing it.

8. PRECIPITATION. Please enter the hours which precipitation fell even though you may not always know them exactly. Draw a straight line (—) through the hours of occurrence. If the time is uncertain to you, please draw a wavy line (wavy) through the hour when precipitation probably occurred. Precipitation times are shown for the calendar days on which it actually occurred.

8(a). RECORDING PRECIPITATION AMOUNTS. Under "24-hr. Amounts," enter the total precipitation in inches and hundredths (rain or melted hail, ice pellets or snow) which has accumulated during the 24 hours preceding the time of observation. ENTER THE AMOUNT ON THE DATE OF MEASUREMENT, even if some or all of it actually fell on the preceding calendar day. If the amount falling was too small to measure, enter "T" for a trace.

Every entry of .01" or more must be recorded to two decimal places, taking care to enter the decimal point in its proper place. For example, record nine-hundredths as .09, exactly two inches as 2.00, and a half inch as .50. If no precipitation occurred during the 24-hour observation period, a "0" (zero) should be entered so there will be no doubt as to whether any precipitation fell.

The raingage should be emptied immediately after the measurement has been made at the normal time of observation. DO NOT EMPTY THE GAGE AT TIMES OF SPECIAL OBSERVATIONS. However, for rainfall observers who report to a hydrologic service area, it may be necessary to empty the gage at times other than official observation times when water has overflowed the measuring tube.

8(b). MEASURING AND RECORDING FROZEN PRECIPITATION. In freezing weather, when snow or ice pellets are likely to occur, remove the funnel and inner tube of the raingage and leave only the large outer can exposed. Melt the catch of snow or ice pellets by adding a CAREFULLY measured amount of warm water from the tube. After the catch is melted in the can, pour the water into the tube (being careful not to spill any), and measure it.

Then subtract the amount of warm water previously added. The resulting figures are the water equivalents of the snow or ice pellets and should be entered as the amount of precipitation in the "Rain, melted snow, etc." column. If snow, ice pellets or hail fall when the funnel and inner tube have not been removed and it is apparent that the gage has caught only a portion of the precipitation, a section of the newly fallen snow, ice pellets or hail on the ground should be cut, using the outer can as a biscuit cutter, and this section melted and measured as indicated above.

In the "Snow, ice pellets, hail, (Ins. & tenths)" column, enter in inches and TENTHS, the amounts of these types of precipitation having fallen during the past 24 hours. Enter a "T" for depths too small to measure. If the accumulation is exclusively from hail, add a note in the remarks stating the accumulation is solely from hail.

In the next column ["At ob. - Snow, ice pellets, hail, ice on ground (Ins.)"], enter to the nearest INCH the average depth of all snow, ice pellets, and ice (including old and new) and hail remaining on the ground at the time of observation in the vicinity of the station. Enter a "T" for less than one-half inch. If drifting has occurred, make measurements at several points where drifting is the least evident, and enter the average amount. An entry should be made each day in this space as long as snow, ice pellets or ice remains on the ground. As soon as the covering has completely melted, enter "0" for the depth. Once this has been entered, leave the column blank until the next observation time at which there is frozen precipitation on the ground.

9. WEATHER (CALENDAR DAY). The columns marked "FOG," "ICE PELLETS," "GLAZE," "THUNDER," "HAIL," AND "DAMAGING WIND" are designed for easy recording of these elements. Please enter an "X" for the dates on which any of these events occur. This information is very helpful in studying the climate of your area.

10. RIVER STAGES. In the "Condition" column enter (if applicable) one of the capital letters A to H, as described in the "CONDITION OF RIVER AT GAGE" table at the bottom left of the form.

10(a). Enter river stage readings taken at your regular observation time in the "Gage Reading" column [See paragraph 3 for observations taken at other times of day (special observations)]. Enter in feet and hundredths, unless you have been instructed otherwise. When the reading is below the zero of the gage enter a minus sign (-) before the recorded figure except where readings are made from a wire-weight gage. Wire-weight readings should be entered as read from the gage and the minus sign omitted unless instructed otherwise. No entries should be made in the "Adjusted gage readings, etc." column. This space is reserved for use by the National Weather Service Office in entering adjusted stages, etc.

10(b). Occasionally extremely low stages occur, and the river gage will not extend into the water, possibly due to a sandbar covering the lower end of the gage, shifting of the channel away from the gage at low stages, a dry river, no flow, or the gage being in puddle. Any time any of these conditions exist, please enter an asterisk (*) in the "Gage reading" column and note the conditions in the "Remarks" space.

10(c). Enter either "F," "R," "S," or "U" in the "tendency" column to denote a Falling, Rising, Steady, or Unknown river stage tendency at the observation time, respectively.

11. REMARKS. Enter calendar day or p.m. maximum temperatures when lower than 24-hour maxima; and overnight or a.m. minima when higher than 24-hour minima (optional). Write brief reports of unusual weather or flood conditions, giving times and dates. Enter heights and times (if known) of crest stages, if higher than reported in the RIVER STAGE column. Brief reports of storm damage, and durations and amounts of heavy rain are useful. If the amount entered in the "Snow, ice pellets, hail" column was solely from hail, enter "24-hour accumulation solely from hail." If any hail is observed, record the diameter of the largest hailstones to the nearest 1/4 inch, e.g., Hail 1 1/2". These additional remarks are often the only source of this information in your area, and can be very important.

12. SUMS. It would help the National Climatic Data Center or other processing center if you could enter the sums of 24-hour precipitation amounts in both the "Rain, melted snow, etc." and the "Snow, ice pellets, hail" columns. This is optional.

13. MAILING IN YOUR FORMS. After the last observation of the month, please recheck your forms for completeness, accuracy and legibility of all entries. Mail the forms promptly (if possible, by the 3rd day of the next month) to the designated office, using the pre-stamped or business reply envelopes provided.