

**CHEYENNE/F. E. WARREN AFB WY**

Latitude = 41.15 N

WMO No. 725640

Longitude = 104.80 W

Elevation = 6142 feet

Period of Record = 1967 to 1996

Average Pressure = 23.93 inches Hg

**Design Criteria Data**

|                                                  | <b>Design Value</b> | Mean Coincident (Average) Values |                         |                        |                             |
|--------------------------------------------------|---------------------|----------------------------------|-------------------------|------------------------|-----------------------------|
|                                                  |                     | Wet Bulb Temperature (°F)        | Humidity Ratio (gr/lb)  | Wind Speed (mph)       | Prevailing Direction (NSEW) |
| <b>Dry Bulb Temperature (T)</b>                  | <b>(°F)</b>         |                                  |                         |                        |                             |
| Median of Extreme Highs                          | 92                  | 58                               | 38                      | 13.1                   | S                           |
| 0.4% Occurrence                                  | 88                  | 58                               | 41                      | 12.2                   | WNW                         |
| 1.0% Occurrence                                  | 85                  | 57                               | 43                      | 12.0                   | S                           |
| 2.0% Occurrence                                  | 82                  | 57                               | 46                      | 11.7                   | S                           |
| Mean Daily Range                                 | 23                  | -                                | -                       | -                      | -                           |
| 97.5% Occurrence                                 | 9                   | 8                                | 8                       | 11.0                   | N                           |
| 99.0% Occurrence                                 | 1                   | 0                                | 5                       | 11.0                   | N                           |
| 99.6% Occurrence                                 | -5                  | -6                               | 4                       | 9.2                    | N                           |
| Median of Extreme Lows                           | -14                 | -14                              | 2                       | 9.9                    | W                           |
|                                                  | <b>Design Value</b> | Mean Coincident (Average) Values |                         |                        |                             |
|                                                  |                     | Dry Bulb Temperature (°F)        | Humidity Ratio (gr/lb)  | Wind Speed (mph)       | Prevailing Direction (NSEW) |
| <b>Wet Bulb Temperature (T<sub>wb</sub>)</b>     | <b>(°F)</b>         |                                  |                         |                        |                             |
| Median of Extreme Highs                          | 65                  | 78                               | 90                      | 10.7                   | S                           |
| 0.4% Occurrence                                  | 62                  | 77                               | 77                      | 10.8                   | S                           |
| 1.0% Occurrence                                  | 61                  | 76                               | 74                      | 10.9                   | S                           |
| 2.0% Occurrence                                  | 60                  | 75                               | 71                      | 10.9                   | S                           |
|                                                  | <b>Design Value</b> | Mean Coincident (Average) Values |                         |                        |                             |
|                                                  |                     | Dry Bulb Temperature (°F)        | Vapor Pressure (in. Hg) | Wind Speed (mph)       | Prevailing Direction (NSEW) |
| <b>Humidity Ratio (HR)</b>                       | <b>(gr/lb)</b>      |                                  |                         |                        |                             |
| Median of Extreme Highs                          | 99                  | 72                               | 0.54                    | 9.1                    | S                           |
| 0.4% Occurrence                                  | 90                  | 66                               | 0.49                    | 9.4                    | S                           |
| 1.0% Occurrence                                  | 84                  | 65                               | 0.45                    | 10.1                   | S                           |
| 2.0% Occurrence                                  | 81                  | 64                               | 0.44                    | 9.9                    | S                           |
| <b>Air Conditioning/<br/>Humid Area Criteria</b> | <b># of Hours</b>   | T ≥ 93°F                         | T ≥ 80°F                | T <sub>wb</sub> ≥ 73°F | T <sub>wb</sub> ≥ 67°F      |
|                                                  |                     | 4                                | 315                     | 0                      | 1                           |

**Other Site Data**

| Weather Region                                   | Rain Rate<br>100 Year Recurrence<br>(in./hr) | Basic Wind Speed<br>3 sec gust @ 33 ft<br>50 Year Recurrence (mph) | Ventilation Cooling Load Index<br>(Ton-hr/cfm/yr) Base 75°F-RH 60%<br>Latent + Sensible |
|--------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 5                                                | 2.0                                          | 90                                                                 | 0.0 + 0.3                                                                               |
| Ground Water Temperature (°F)<br>50 Foot Depth * | Frost Depth<br>50 Year Recurrence<br>(in.)   | Ground Snow Load<br>50 Year Recurrence<br>(lb/ft <sup>2</sup> )    | Average Annual<br>Freeze-Thaw Cycles<br>(#)                                             |
| 48.2                                             | 59                                           | 18                                                                 | 110                                                                                     |

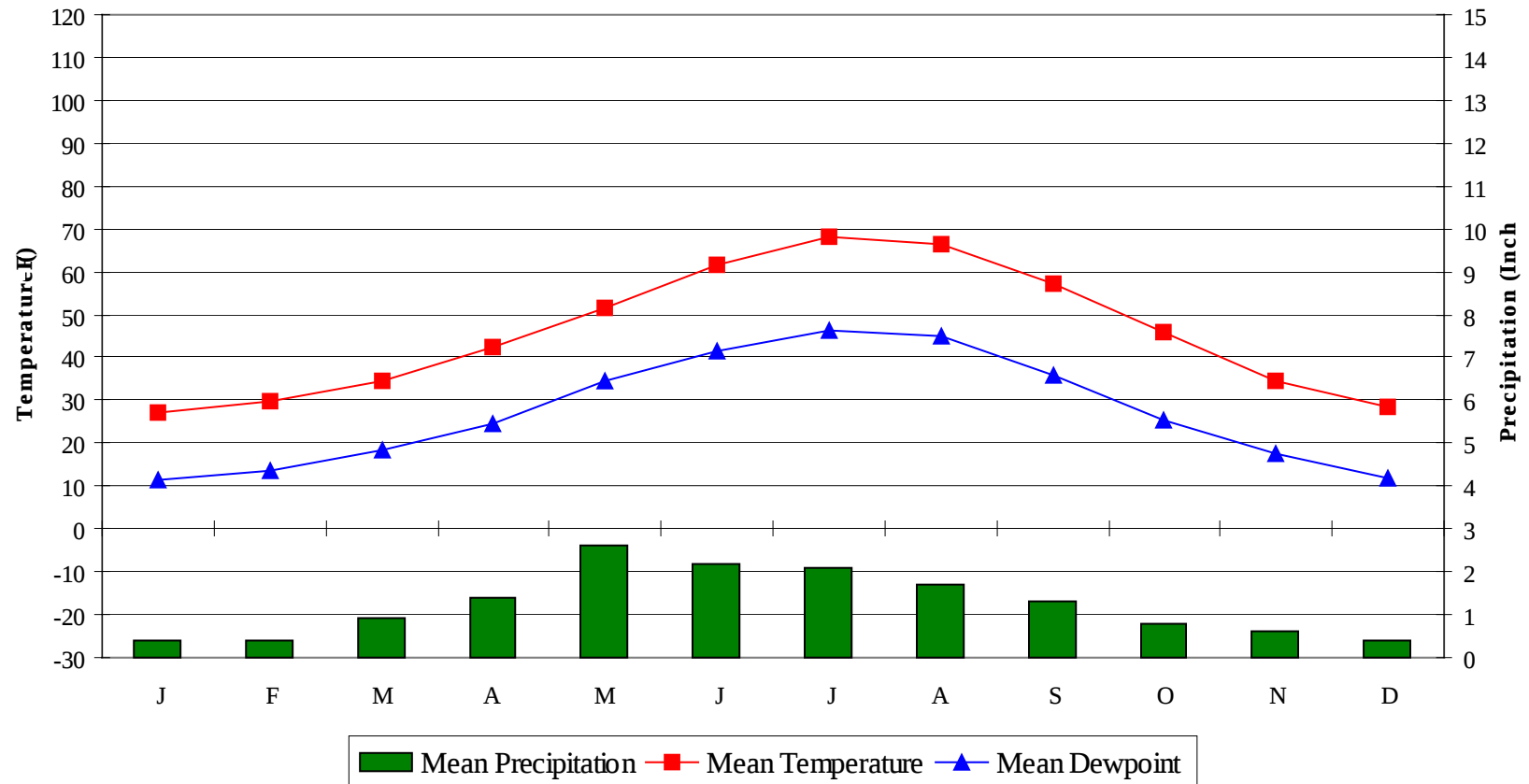
\*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

CHEYENNE/F. E. WARREN AFB

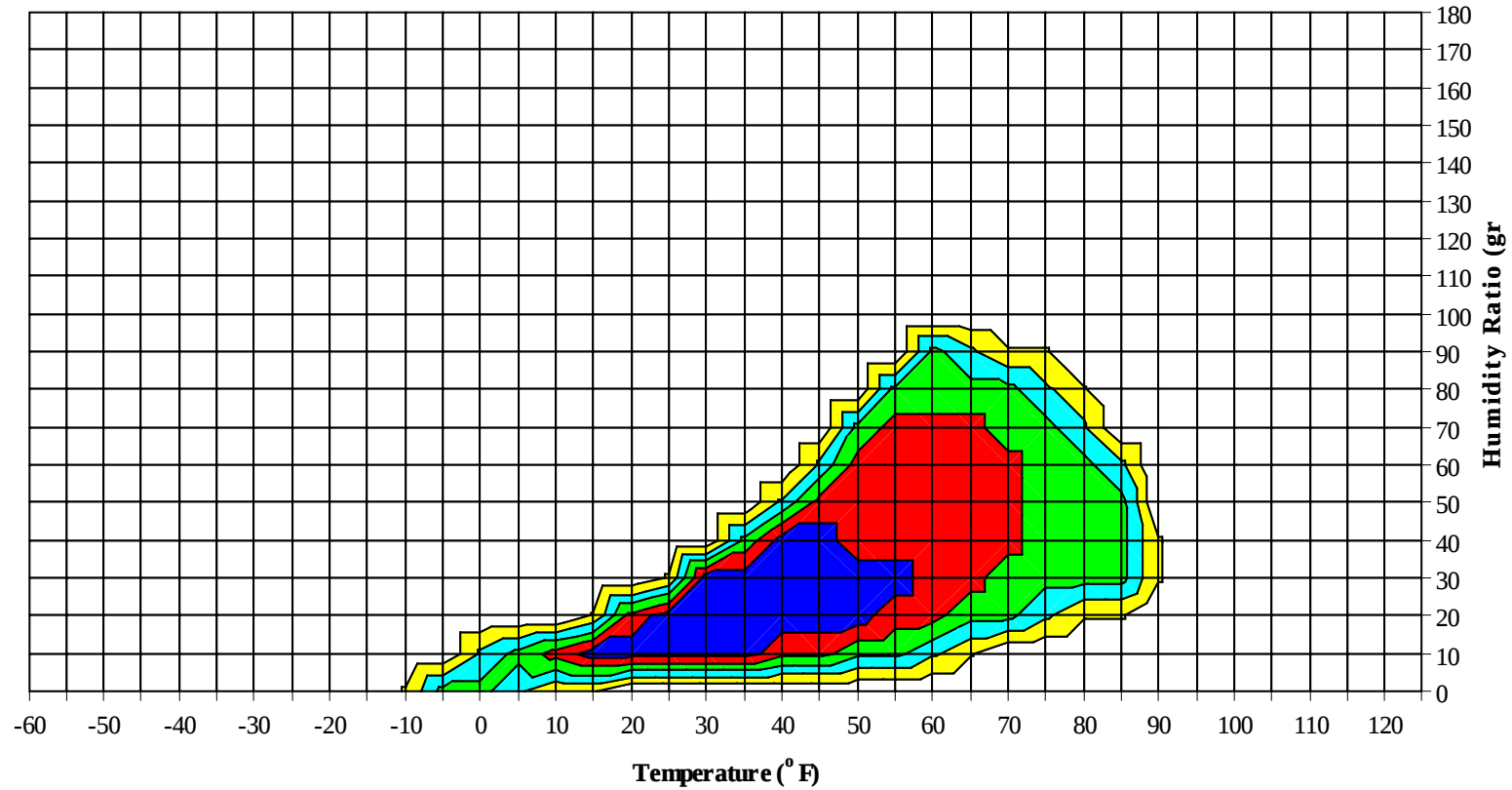
WY

WMO No. 725640

### Average Annual Climate

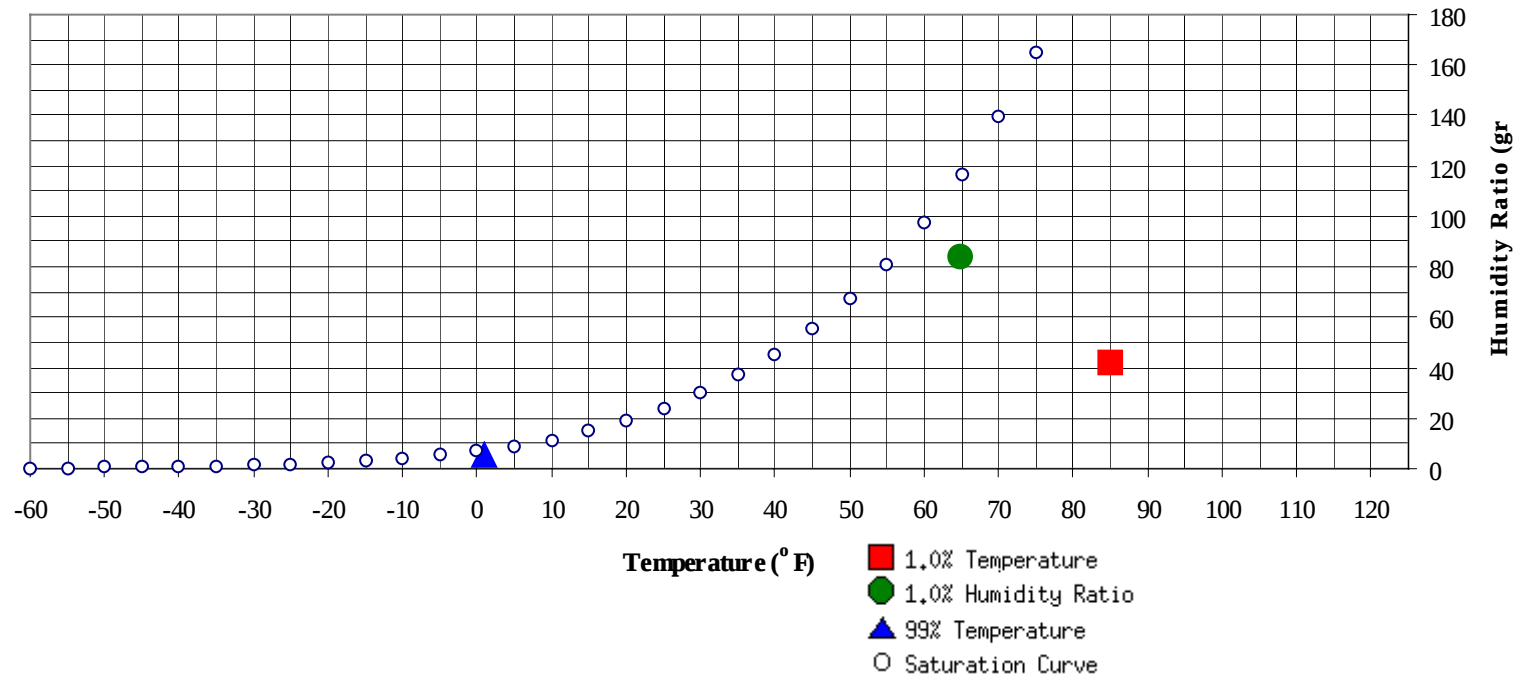


### Long Term Psychrometric Summary



- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

### Psychrometric Summary of Peak Design Values



|              | (°F) | MCHR<br>(gr/lb) | Enthalpy<br>(btu/lb) | 1.0% Humidity<br>Ratio | (gr/lb) | MCDB<br>(°F) | MCWB<br>(°F) | MC Dewpt<br>(°F) | Enthalpy<br>(btu/lb) |
|--------------|------|-----------------|----------------------|------------------------|---------|--------------|--------------|------------------|----------------------|
| 99% Dry Bulb | 1    | 5.3             | 1.0                  |                        | 84      | 64.8         | 58.9         | 56               | 28.6                 |

|               | (°F) | MCHR<br>(gr/lb) | MCWB<br>(°F) | Enthalpy<br>(btu/lb) |
|---------------|------|-----------------|--------------|----------------------|
| 1.0% Dry Bulb | 85   | 42.3            | 57.1         | 27.0                 |

**CHEYENNE/F. E. WARREN AFB WY WMO No. 725640**

**Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)**

**Period of Record = 1967 to 1996**

| Temperature<br>Range<br>(°F) | January             |                |                |              |                          | February            |                |                |              |                          | March               |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|
|                              | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) |
|                              | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          |
| 95 / 99                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 90 / 94                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 85 / 89                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 80 / 84                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 75 / 79                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 70 / 74                      |                     |                |                |              |                          |                     |                |                |              |                          |                     | 1              | 0              | 1            | 46.6                     |
| 65 / 69                      |                     | 0              |                | 0            | 44.0                     |                     | 0              |                | 0            | 44.2                     |                     | 4              | 1              | 5            | 44.7                     |
| 60 / 64                      |                     | 1              |                | 1            | 41.1                     |                     | 3              | 0              | 3            | 41.4                     | 0                   | 12             | 2              | 13           | 41.9                     |
| 55 / 59                      |                     | 5              | 0              | 5            | 38.8                     |                     | 9              | 1              | 10           | 39.0                     | 1                   | 21             | 6              | 27           | 39.9                     |
| 50 / 54                      | 0                   | 16             | 2              | 18           | 36.9                     | 0                   | 22             | 3              | 25           | 37.1                     | 2                   | 31             | 12             | 46           | 37.8                     |
| 45 / 49                      | 4                   | 26             | 7              | 38           | 34.7                     | 4                   | 32             | 11             | 46           | 34.6                     | 7                   | 33             | 20             | 61           | 35.6                     |
| 40 / 44                      | 16                  | 38             | 21             | 75           | 32.1                     | 15                  | 34             | 25             | 74           | 32.2                     | 21                  | 37             | 33             | 91           | 33.1                     |
| 35 / 39                      | 29                  | 38             | 38             | 105          | 29.3                     | 27                  | 36             | 36             | 99           | 29.3                     | 39                  | 33             | 47             | 119          | 30.7                     |
| 30 / 34                      | 36                  | 32             | 41             | 109          | 26.0                     | 38                  | 28             | 41             | 108          | 26.4                     | 55                  | 31             | 48             | 134          | 27.7                     |
| 25 / 29                      | 41                  | 28             | 39             | 108          | 22.7                     | 42                  | 21             | 38             | 101          | 23.2                     | 52                  | 23             | 35             | 110          | 24.2                     |
| 20 / 24                      | 37                  | 21             | 32             | 90           | 18.9                     | 36                  | 14             | 26             | 76           | 19.4                     | 32                  | 10             | 21             | 64           | 20.1                     |
| 15 / 19                      | 30                  | 17             | 24             | 70           | 14.5                     | 25                  | 8              | 17             | 51           | 15.3                     | 18                  | 6              | 13             | 37           | 15.7                     |
| 10 / 14                      | 19                  | 10             | 17             | 46           | 10.2                     | 15                  | 5              | 9              | 30           | 10.9                     | 9                   | 3              | 5              | 18           | 10.9                     |
| 5 / 9                        | 15                  | 6              | 11             | 33           | 5.7                      | 7                   | 4              | 5              | 16           | 5.8                      | 5                   | 2              | 3              | 11           | 6.2                      |
| 0 / 4                        | 10                  | 6              | 9              | 24           | 0.9                      | 5                   | 3              | 5              | 12           | 1.3                      | 3                   | 1              | 2              | 5            | 1.4                      |
| -5 / -1                      | 6                   | 2              | 5              | 12           | -3.3                     | 3                   | 2              | 2              | 7            | -3.2                     | 1                   | 0              | 1              | 2            | -3.0                     |
| -10 / -6                     | 4                   | 1              | 2              | 7            | -7.4                     | 2                   | 1              | 2              | 5            | -7.6                     | 1                   |                | 0              | 1            | -6.9                     |
| -15 / -11                    | 2                   | 0              | 1              | 3            | -12.4                    | 1                   | 0              | 1              | 2            | -12.1                    |                     |                |                |              |                          |
| -20 / -16                    | 1                   |                | 0              | 1            | -16.7                    | 1                   | 0              | 0              | 2            | -16.5                    |                     |                |                |              |                          |
| -25 / -21                    | 0                   |                | 0              | 0            | -21.8                    | 1                   | 0              | 1              | 3            | -22.0                    |                     |                |                |              |                          |
| -30 / -26                    | 0                   |                | 0              | 0            | -25.8                    |                     |                |                |              |                          |                     |                |                |              |                          |

**Caution:** This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

CHEYENNE/F. E. WARREN AFB WY WMO No. 725640

Dry-Bulb Temperature Hours For An Average Year (Sheet 2 of 5)

Period of Record = 1967 to 1996

| Temperature<br>Range<br>(°F) | April               |                |                |              |                          | May                 |                |                |              |                          | June                |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|
|                              | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) |
|                              | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          |
| 95 / 99                      |                     |                |                |              |                          |                     |                |                |              |                          |                     | 0              | 0              | 0            | 58.9                     |
| 90 / 94                      |                     |                |                |              |                          |                     |                |                |              |                          |                     | 2              | 0              | 2            | 58.9                     |
| 85 / 89                      |                     |                |                |              |                          |                     | 1              | 0              | 1            | 53.3                     |                     | 12             | 2              | 13           | 57.3                     |
| 80 / 84                      |                     | 0              | 0              | 0            | 49.4                     |                     | 3              | 0              | 4            | 53.0                     | 0                   | 31             | 8              | 40           | 56.2                     |
| 75 / 79                      |                     | 3              | 0              | 3            | 48.9                     | 0                   | 14             | 3              | 17           | 52.1                     | 2                   | 41             | 15             | 58           | 55.8                     |
| 70 / 74                      |                     | 11             | 2              | 13           | 47.7                     | 1                   | 29             | 9              | 39           | 50.9                     | 7                   | 43             | 26             | 76           | 54.7                     |
| 65 / 69                      | 0                   | 20             | 5              | 25           | 46.0                     | 3                   | 33             | 13             | 49           | 49.8                     | 14                  | 38             | 34             | 86           | 53.3                     |
| 60 / 64                      | 1                   | 27             | 10             | 39           | 44.1                     | 7                   | 42             | 22             | 72           | 48.1                     | 27                  | 29             | 46             | 103          | 51.3                     |
| 55 / 59                      | 5                   | 29             | 17             | 51           | 42.1                     | 17                  | 40             | 37             | 94           | 46.0                     | 54                  | 22             | 47             | 122          | 49.5                     |
| 50 / 54                      | 10                  | 32             | 26             | 69           | 40.1                     | 38                  | 33             | 49             | 120          | 44.2                     | 65                  | 13             | 35             | 113          | 47.0                     |
| 45 / 49                      | 23                  | 33             | 34             | 89           | 37.8                     | 55                  | 23             | 47             | 125          | 41.7                     | 40                  | 5              | 19             | 65           | 43.2                     |
| 40 / 44                      | 39                  | 28             | 41             | 107          | 35.4                     | 64                  | 16             | 37             | 117          | 38.3                     | 23                  | 3              | 8              | 33           | 39.2                     |
| 35 / 39                      | 56                  | 26             | 40             | 122          | 32.3                     | 40                  | 9              | 20             | 70           | 34.1                     | 6                   | 1              | 1              | 8            | 35.1                     |
| 30 / 34                      | 50                  | 18             | 35             | 103          | 28.7                     | 19                  | 4              | 8              | 31           | 30.3                     | 0                   |                |                | 0            | 30.6                     |
| 25 / 29                      | 35                  | 9              | 19             | 63           | 24.9                     | 4                   | 0              | 1              | 6            | 25.7                     |                     |                |                |              |                          |
| 20 / 24                      | 12                  | 3              | 6              | 21           | 20.7                     | 1                   |                | 0              | 1            | 21.5                     |                     |                |                |              |                          |
| 15 / 19                      | 6                   | 1              | 3              | 10           | 16.2                     | 0                   |                |                | 0            | 19.0                     |                     |                |                |              |                          |
| 10 / 14                      | 2                   | 0              | 1              | 2            | 11.1                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 5 / 9                        | 1                   | 0              | 0              | 2            | 6.1                      |                     |                |                |              |                          |                     |                |                |              |                          |
| 0 / 4                        | 0                   |                | 0              | 1            | 2.8                      |                     |                |                |              |                          |                     |                |                |              |                          |
| -5 / -1                      | 0                   |                | 0              | 0            | -3.3                     |                     |                |                |              |                          |                     |                |                |              |                          |
| -10 / -6                     | 0                   |                | 0              | 0            | -7.0                     |                     |                |                |              |                          |                     |                |                |              |                          |
| -15 / -11                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -20 / -16                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -25 / -21                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -30 / -26                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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**Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)**

**Period of Record = 1967 to 1996**

| Temperature<br>Range<br>(°F) | July                |                |                |              |                          | August              |                |                |              |                          | September           |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|
|                              | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) |
|                              | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          |
| 95 / 99                      |                     | 1              |                | 1            | 58.8                     |                     | 0              |                | 0            | 58.4                     |                     |                |                |              |                          |
| 90 / 94                      |                     | 9              | 1              | 10           | 58.5                     |                     | 5              | 0              | 5            | 58.2                     |                     | 0              | 0              | 0            | 57.4                     |
| 85 / 89                      | 0                   | 34             | 7              | 41           | 58.0                     |                     | 22             | 3              | 24           | 57.3                     |                     | 5              | 0              | 6            | 55.7                     |
| 80 / 84                      | 2                   | 58             | 16             | 76           | 57.9                     | 1                   | 57             | 10             | 68           | 57.3                     |                     | 21             | 3              | 24           | 54.5                     |
| 75 / 79                      | 6                   | 55             | 25             | 85           | 57.8                     | 3                   | 62             | 21             | 87           | 57.1                     | 0                   | 39             | 7              | 47           | 53.0                     |
| 70 / 74                      | 14                  | 47             | 42             | 102          | 56.9                     | 10                  | 48             | 37             | 95           | 56.1                     | 2                   | 47             | 16             | 66           | 51.9                     |
| 65 / 69                      | 30                  | 24             | 52             | 106          | 55.4                     | 22                  | 26             | 51             | 98           | 55.0                     | 6                   | 35             | 24             | 65           | 50.7                     |
| 60 / 64                      | 65                  | 13             | 61             | 139          | 53.9                     | 56                  | 15             | 65             | 136          | 53.5                     | 16                  | 29             | 38             | 84           | 49.2                     |
| 55 / 59                      | 84                  | 6              | 34             | 124          | 52.1                     | 84                  | 7              | 44             | 136          | 51.3                     | 42                  | 23             | 48             | 113          | 47.2                     |
| 50 / 54                      | 39                  | 2              | 10             | 50           | 48.8                     | 53                  | 3              | 14             | 70           | 47.9                     | 56                  | 16             | 42             | 113          | 44.8                     |
| 45 / 49                      | 8                   | 0              | 1              | 9            | 44.5                     | 16                  | 1              | 4              | 21           | 43.8                     | 52                  | 11             | 32             | 94           | 41.5                     |
| 40 / 44                      | 1                   | 0              |                | 1            | 41.4                     | 3                   | 0              | 0              | 3            | 39.1                     | 38                  | 6              | 18             | 62           | 38.0                     |
| 35 / 39                      |                     |                |                |              |                          | 0                   |                |                | 0            | 34.8                     | 17                  | 3              | 7              | 27           | 34.1                     |
| 30 / 34                      |                     |                |                |              |                          |                     |                |                |              |                          | 7                   | 2              | 4              | 13           | 30.2                     |
| 25 / 29                      |                     |                |                |              |                          |                     |                |                |              |                          | 2                   | 1              | 2              | 5            | 26.1                     |
| 20 / 24                      |                     |                |                |              |                          |                     |                |                |              |                          | 1                   | 1              | 1              | 2            | 21.0                     |
| 15 / 19                      |                     |                |                |              |                          |                     |                |                |              |                          | 1                   |                | 0              | 1            | 18.5                     |
| 10 / 14                      |                     |                |                |              |                          |                     |                |                |              |                          | 0                   |                | 0              | 0            | 11.8                     |
| 5 / 9                        |                     |                |                |              |                          |                     |                |                |              |                          | 0                   |                |                | 0            | 8.0                      |
| 0 / 4                        |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -5 / -1                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -10 / -6                     |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -15 / -11                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -20 / -16                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -25 / -21                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -30 / -26                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |

**Caution:** This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

**CHEYENNE/F. E. WARREN AFB WY WMO No. 725640**

**Dry-Bulb Temperature Hours For An Average Year (Sheet 4 of 5)**

**Period of Record = 1967 to 1996**

| Temperature<br>Range<br>(°F) | October             |                |                |              |                          | November            |                |                |              |                          | December            |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|---------------------|----------------|----------------|--------------|--------------------------|
|                              | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) |
|                              | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          |
| 95 / 99                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 90 / 94                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 85 / 89                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 80 / 84                      |                     | 1              |                | 1            | 50.2                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 75 / 79                      |                     | 9              | 0              | 9            | 49.5                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 70 / 74                      |                     | 20             | 2              | 22           | 47.6                     |                     | 0              |                | 0            | 44.3                     |                     |                |                |              |                          |
| 65 / 69                      | 0                   | 31             | 5              | 36           | 46.2                     |                     | 4              |                | 4            | 44.8                     |                     | 0              |                | 0            | 45.0                     |
| 60 / 64                      | 2                   | 38             | 11             | 51           | 44.7                     |                     | 13             | 0              | 14           | 42.8                     |                     | 3              |                | 3            | 41.2                     |
| 55 / 59                      | 9                   | 35             | 20             | 64           | 42.5                     | 1                   | 22             | 3              | 25           | 40.8                     |                     | 8              | 0              | 9            | 39.2                     |
| 50 / 54                      | 22                  | 31             | 35             | 89           | 40.3                     | 6                   | 29             | 10             | 45           | 38.3                     | 1                   | 18             | 2              | 21           | 37.3                     |
| 45 / 49                      | 38                  | 26             | 45             | 109          | 38.2                     | 14                  | 31             | 19             | 64           | 35.7                     | 8                   | 27             | 10             | 45           | 34.7                     |
| 40 / 44                      | 54                  | 19             | 48             | 122          | 35.7                     | 27                  | 32             | 35             | 93           | 33.0                     | 18                  | 34             | 22             | 74           | 32.0                     |
| 35 / 39                      | 47                  | 16             | 35             | 97           | 32.3                     | 38                  | 31             | 41             | 110          | 30.3                     | 26                  | 40             | 32             | 98           | 29.0                     |
| 30 / 34                      | 39                  | 15             | 27             | 80           | 28.8                     | 42                  | 26             | 41             | 109          | 27.4                     | 37                  | 34             | 44             | 116          | 26.0                     |
| 25 / 29                      | 23                  | 4              | 12             | 40           | 25.0                     | 40                  | 22             | 36             | 98           | 23.7                     | 46                  | 32             | 43             | 121          | 22.8                     |
| 20 / 24                      | 8                   | 2              | 5              | 15           | 20.7                     | 31                  | 15             | 26             | 71           | 19.8                     | 38                  | 18             | 34             | 90           | 19.1                     |
| 15 / 19                      | 3                   | 1              | 1              | 5            | 15.8                     | 22                  | 8              | 17             | 46           | 15.5                     | 31                  | 12             | 24             | 67           | 14.9                     |
| 10 / 14                      | 1                   | 0              | 1              | 2            | 11.3                     | 11                  | 4              | 8              | 22           | 10.8                     | 16                  | 10             | 16             | 42           | 10.7                     |
| 5 / 9                        | 1                   | 0              | 1              | 1            | 6.2                      | 5                   | 1              | 4              | 10           | 6.1                      | 10                  | 5              | 8              | 23           | 5.8                      |
| 0 / 4                        | 0                   |                | 0              | 1            | 1.1                      | 2                   | 0              | 1              | 3            | 1.3                      | 7                   | 2              | 6              | 15           | 1.2                      |
| -5 / -1                      |                     |                |                |              |                          | 1                   | 1              | 1              | 3            | -3.1                     | 3                   | 1              | 2              | 7            | -3.2                     |
| -10 / -6                     |                     |                |                |              |                          | 1                   |                | 0              | 1            | -7.4                     | 2                   | 1              | 2              | 5            | -7.3                     |
| -15 / -11                    |                     |                |                |              |                          | 0                   |                | 0              | 1            | -11.9                    | 2                   | 1              | 1              | 4            | -12.2                    |
| -20 / -16                    |                     |                |                |              |                          |                     |                | 0              | 0            | -16.0                    | 1                   | 1              | 1              | 2            | -17.0                    |
| -25 / -21                    |                     |                |                |              |                          |                     |                |                |              |                          | 1                   | 0              | 1              | 2            | -22.0                    |
| -30 / -26                    |                     |                |                |              |                          |                     |                |                |              |                          | 0                   | 0              | 0              | 1            | -26.2                    |

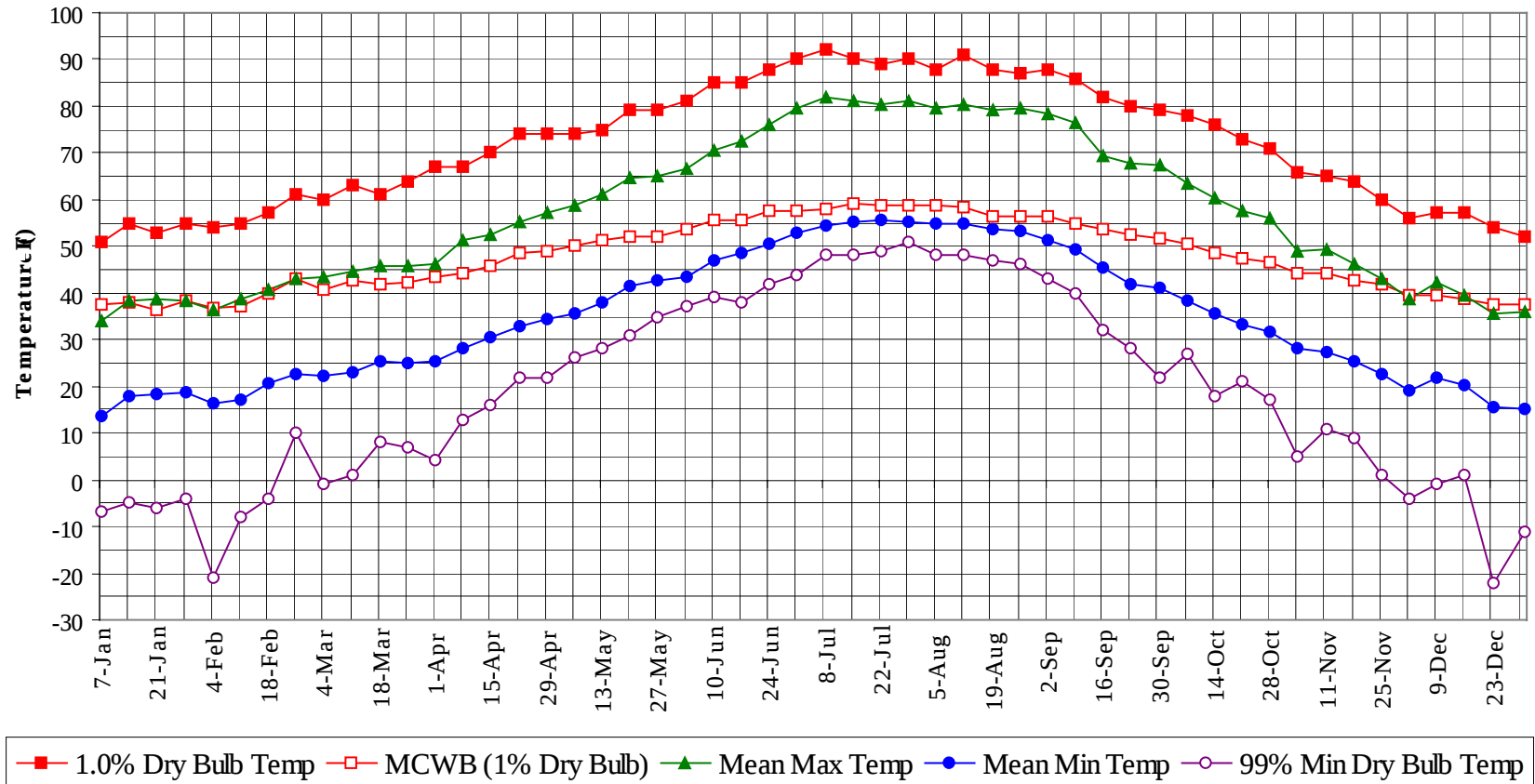
**Caution:** This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

**CHEYENNE/F. E. WARREN AFB WY WMO No. 725640**  
**Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)**  
**Period of Record = 1967 to 1996**

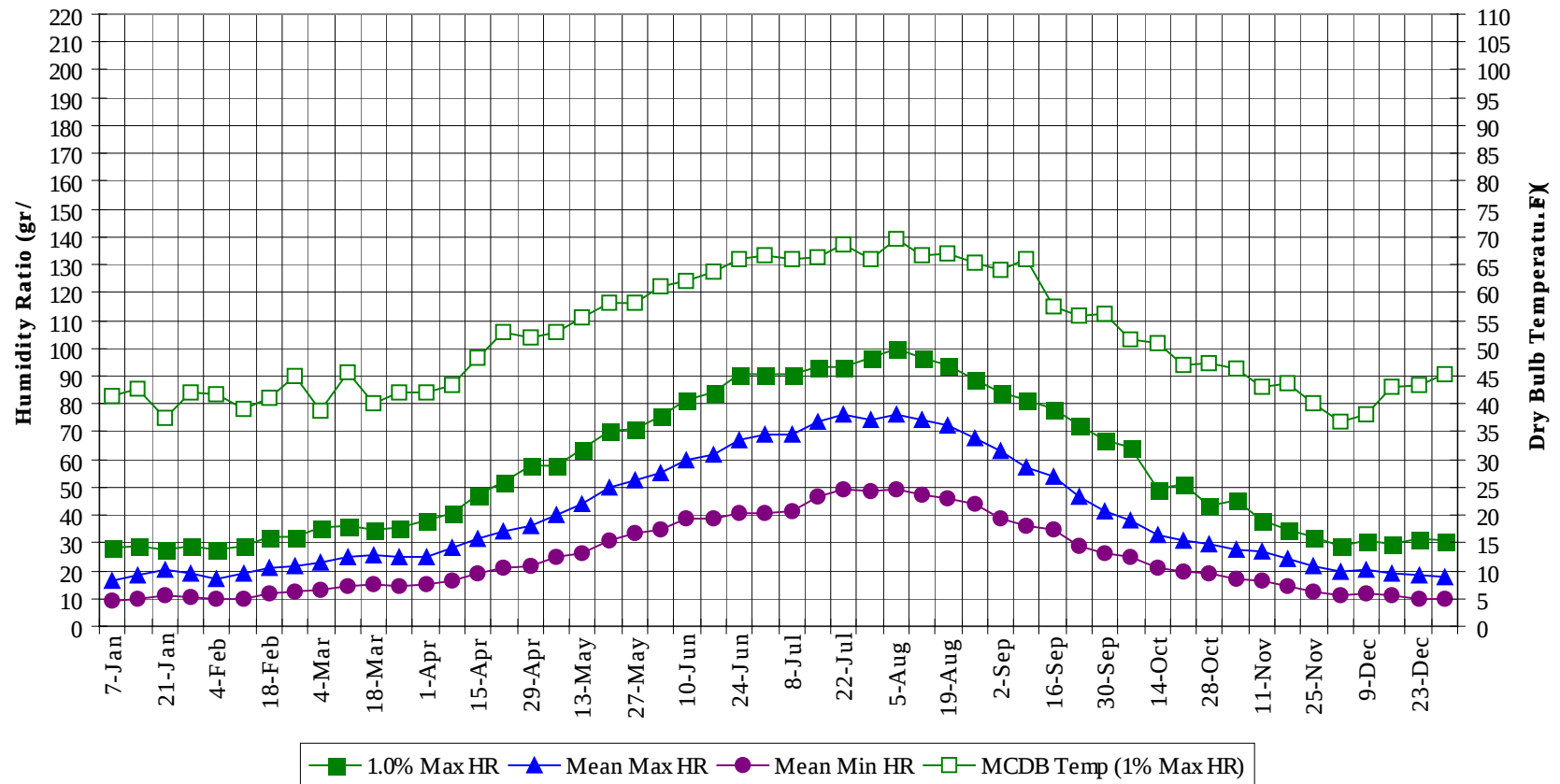
| Temperature<br>Range<br>(°F) | Annual Totals       |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|
|                              | Hour<br>Group (LST) |                |                | Total<br>Obs | M<br>C<br>W<br>B<br>(°F) |
|                              | 01<br>To<br>08      | 09<br>To<br>16 | 17<br>To<br>00 |              |                          |
| 95 / 99                      |                     | 1              | 0              | 1            | 58.7                     |
| 90 / 94                      |                     | 16             | 2              | 18           | 58.4                     |
| 85 / 89                      | 0                   | 73             | 11             | 84           | 57.5                     |
| 80 / 84                      | 3                   | 172            | 37             | 212          | 56.9                     |
| 75 / 79                      | 12                  | 222            | 71             | 305          | 55.8                     |
| 70 / 74                      | 34                  | 247            | 132            | 413          | 54.2                     |
| 65 / 69                      | 75                  | 216            | 184            | 474          | 52.3                     |
| 60 / 64                      | 175                 | 225            | 255            | 655          | 50.3                     |
| 55 / 59                      | 295                 | 227            | 255            | 777          | 47.5                     |
| 50 / 54                      | 292                 | 245            | 239            | 776          | 43.2                     |
| 45 / 49                      | 269                 | 248            | 249            | 766          | 38.8                     |
| 40 / 44                      | 318                 | 247            | 287            | 852          | 34.8                     |
| 35 / 39                      | 327                 | 233            | 297            | 857          | 31.0                     |
| 30 / 34                      | 323                 | 191            | 291            | 805          | 27.4                     |
| 25 / 29                      | 286                 | 141            | 226            | 653          | 23.6                     |
| 20 / 24                      | 197                 | 85             | 150            | 432          | 19.5                     |
| 15 / 19                      | 135                 | 54             | 99             | 288          | 15.2                     |
| 10 / 14                      | 74                  | 32             | 57             | 163          | 10.6                     |
| 5 / 9                        | 44                  | 20             | 32             | 96           | 5.9                      |
| 0 / 4                        | 27                  | 12             | 22             | 61           | 1.1                      |
| -5 / -1                      | 14                  | 5              | 11             | 31           | -3.2                     |
| -10 / -6                     | 9                   | 3              | 7              | 19           | -7.4                     |
| -15 / -11                    | 5                   | 2              | 3              | 10           | -12.2                    |
| -20 / -16                    | 2                   | 1              | 1              | 4            | -16.8                    |
| -25 / -21                    | 3                   | 1              | 2              | 5            | -22.0                    |
| -30 / -26                    | 1                   | 0              | 0              | 1            | -26.1                    |

**Caution:** This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

### Annual Summary of Temperatures



## Long Term Humidity and Dry Bulb Temperature Summary



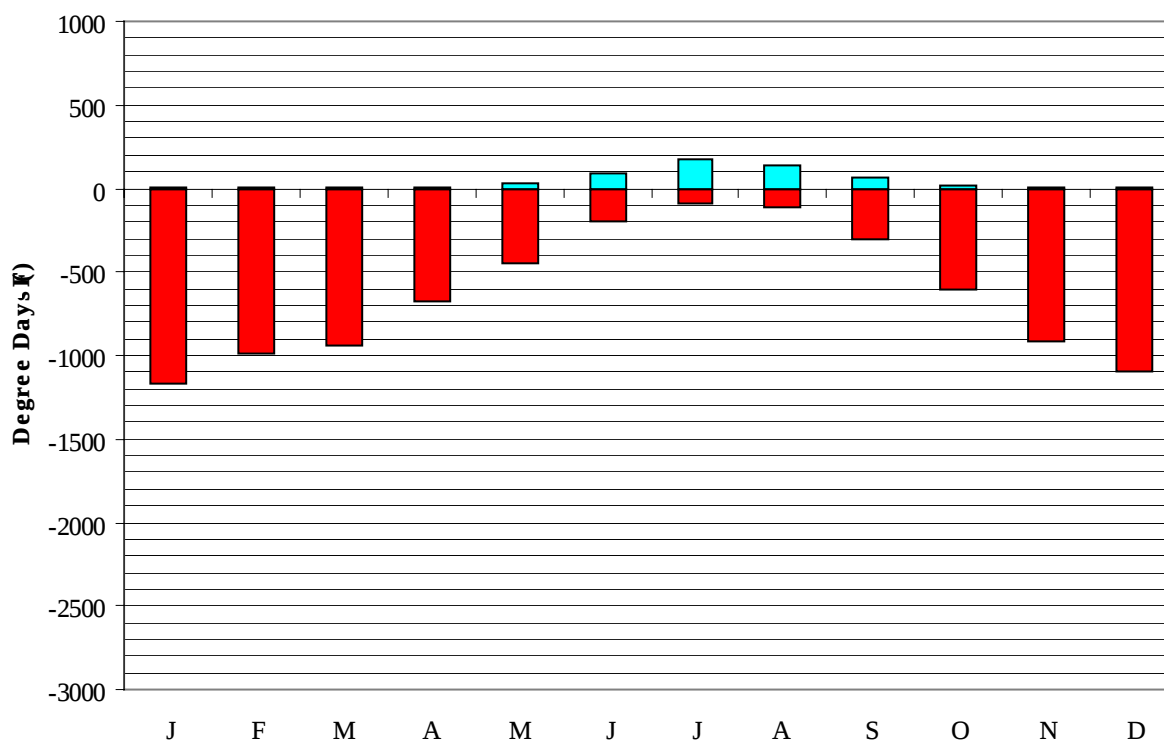
**CHEYENNE/F. E. WARREN AFB WY WMO No. 725640**

**Long Term Dry Bulb Temperature and Humidity Summary**

| Week<br>Ending | 1.0%<br>Temp (°F) | MCWB @<br>1% Temp (°F) | Mean Max<br>Temp (°F) | Mean Min<br>Temp (°F) | 99%<br>Temp (°F) | 1.0%<br>HR (gr/lb) | MCDB @<br>1% HR (°F) | Mean Max<br>HR (gr/lb) | Mean Min<br>HR (gr/lb) |
|----------------|-------------------|------------------------|-----------------------|-----------------------|------------------|--------------------|----------------------|------------------------|------------------------|
| 7-Jan          | 51.0              | 37.4                   | 33.9                  | 13.4                  | -7.0             | 28.0               | 41.3                 | 16.7                   | 9.0                    |
| 14-Jan         | 55.0              | 37.8                   | 38.3                  | 17.8                  | -5.0             | 28.7               | 42.8                 | 18.3                   | 10.0                   |
| 21-Jan         | 53.0              | 36.5                   | 38.6                  | 18.3                  | -6.0             | 27.3               | 37.5                 | 20.3                   | 11.4                   |
| 28-Jan         | 55.0              | 38.4                   | 38.5                  | 18.8                  | -4.0             | 28.7               | 42.1                 | 19.1                   | 10.6                   |
| 4-Feb          | 54.0              | 36.6                   | 36.5                  | 16.3                  | -21.0            | 27.3               | 41.7                 | 17.2                   | 9.8                    |
| 11-Feb         | 55.0              | 37.2                   | 38.9                  | 17.0                  | -8.0             | 28.7               | 38.9                 | 18.8                   | 10.0                   |
| 18-Feb         | 57.0              | 40.1                   | 40.6                  | 20.5                  | -4.0             | 32.2               | 40.9                 | 20.9                   | 11.8                   |
| 25-Feb         | 61.0              | 42.9                   | 43.2                  | 22.6                  | 10.0             | 32.2               | 45.0                 | 21.9                   | 12.8                   |
| 4-Mar          | 60.0              | 40.6                   | 43.5                  | 22.2                  | -1.0             | 35.7               | 38.9                 | 23.0                   | 13.4                   |
| 11-Mar         | 63.0              | 42.6                   | 44.7                  | 23.1                  | 1.0              | 36.4               | 45.7                 | 24.6                   | 14.3                   |
| 18-Mar         | 61.0              | 41.9                   | 45.8                  | 25.2                  | 8.0              | 35.0               | 39.9                 | 25.4                   | 15.0                   |
| 25-Mar         | 64.0              | 42.3                   | 45.8                  | 24.8                  | 7.0              | 35.7               | 42.0                 | 25.0                   | 14.4                   |
| 1-Apr          | 67.0              | 43.5                   | 46.2                  | 25.3                  | 4.0              | 37.8               | 42.0                 | 25.2                   | 15.3                   |
| 8-Apr          | 67.0              | 44.0                   | 51.1                  | 28.3                  | 13.0             | 40.6               | 43.3                 | 28.5                   | 16.6                   |
| 15-Apr         | 70.0              | 45.9                   | 52.5                  | 30.3                  | 16.0             | 47.6               | 48.2                 | 31.6                   | 18.9                   |
| 22-Apr         | 74.0              | 48.4                   | 55.2                  | 32.9                  | 22.0             | 51.8               | 52.7                 | 34.3                   | 21.1                   |
| 29-Apr         | 74.0              | 48.8                   | 57.1                  | 34.2                  | 22.0             | 58.1               | 51.9                 | 36.1                   | 21.4                   |
| 6-May          | 74.0              | 50.3                   | 58.7                  | 35.7                  | 26.0             | 58.1               | 53.0                 | 40.3                   | 24.9                   |
| 13-May         | 75.0              | 51.4                   | 61.2                  | 38.1                  | 28.0             | 63.7               | 55.6                 | 44.1                   | 26.5                   |
| 20-May         | 79.0              | 52.3                   | 64.6                  | 41.4                  | 31.0             | 70.0               | 58.2                 | 49.6                   | 30.7                   |
| 27-May         | 79.0              | 52.1                   | 65.0                  | 42.6                  | 35.0             | 70.7               | 58.3                 | 52.3                   | 33.6                   |
| 3-Jun          | 81.0              | 53.6                   | 66.5                  | 43.5                  | 37.0             | 75.6               | 60.9                 | 55.2                   | 34.7                   |
| 10-Jun         | 85.0              | 55.5                   | 70.4                  | 47.1                  | 39.0             | 81.2               | 62.0                 | 59.9                   | 39.1                   |
| 17-Jun         | 85.0              | 55.7                   | 72.7                  | 48.4                  | 38.0             | 84.0               | 63.7                 | 62.0                   | 38.4                   |
| 24-Jun         | 88.0              | 57.6                   | 76.0                  | 50.4                  | 42.0             | 90.3               | 65.9                 | 66.7                   | 41.0                   |
| 1-Jul          | 90.0              | 57.7                   | 79.5                  | 52.7                  | 44.0             | 90.3               | 66.7                 | 68.8                   | 40.8                   |
| 8-Jul          | 92.0              | 57.9                   | 82.0                  | 54.5                  | 48.0             | 90.3               | 65.9                 | 68.8                   | 41.5                   |
| 15-Jul         | 90.0              | 59.0                   | 81.2                  | 55.2                  | 48.0             | 93.1               | 66.4                 | 73.9                   | 46.6                   |
| 22-Jul         | 89.0              | 58.9                   | 80.5                  | 55.5                  | 49.0             | 93.1               | 68.7                 | 76.0                   | 49.2                   |
| 29-Jul         | 90.0              | 58.7                   | 81.1                  | 55.3                  | 51.0             | 96.6               | 65.9                 | 74.5                   | 48.8                   |
| 5-Aug          | 88.0              | 58.7                   | 79.7                  | 54.9                  | 48.0             | 100.1              | 69.6                 | 76.3                   | 49.4                   |
| 12-Aug         | 91.0              | 58.2                   | 80.4                  | 54.7                  | 48.0             | 96.6               | 66.6                 | 74.3                   | 47.0                   |
| 19-Aug         | 88.0              | 56.6                   | 79.0                  | 53.6                  | 47.0             | 93.8               | 67.1                 | 72.3                   | 46.1                   |
| 26-Aug         | 87.0              | 56.5                   | 79.5                  | 53.4                  | 46.0             | 88.9               | 65.4                 | 68.0                   | 43.9                   |
| 2-Sep          | 88.0              | 56.6                   | 78.3                  | 51.5                  | 43.0             | 84.0               | 64.0                 | 63.2                   | 38.9                   |
| 9-Sep          | 86.0              | 54.9                   | 76.3                  | 49.2                  | 40.0             | 81.2               | 65.9                 | 57.3                   | 35.8                   |
| 16-Sep         | 82.0              | 53.7                   | 69.3                  | 45.3                  | 32.0             | 78.4               | 57.6                 | 53.9                   | 34.7                   |
| 23-Sep         | 80.0              | 52.4                   | 67.7                  | 41.8                  | 28.0             | 72.1               | 56.0                 | 46.7                   | 29.0                   |
| 30-Sep         | 79.0              | 51.6                   | 67.5                  | 40.9                  | 22.0             | 67.2               | 56.2                 | 41.2                   | 26.3                   |
| 7-Oct          | 78.0              | 50.3                   | 63.4                  | 38.4                  | 27.0             | 64.4               | 51.4                 | 38.3                   | 25.2                   |
| 14-Oct         | 76.0              | 48.5                   | 60.2                  | 35.6                  | 18.0             | 49.0               | 50.8                 | 33.0                   | 21.2                   |
| 21-Oct         | 73.0              | 47.3                   | 57.6                  | 33.4                  | 21.0             | 51.1               | 46.8                 | 31.0                   | 19.9                   |
| 28-Oct         | 71.0              | 46.7                   | 56.0                  | 31.5                  | 17.0             | 43.4               | 47.3                 | 29.4                   | 18.8                   |
| 4-Nov          | 66.0              | 44.2                   | 49.0                  | 28.0                  | 5.0              | 45.5               | 46.3                 | 27.9                   | 17.4                   |
| 11-Nov         | 65.0              | 44.1                   | 49.2                  | 27.3                  | 11.0             | 37.8               | 43.1                 | 26.7                   | 16.1                   |
| 18-Nov         | 64.0              | 42.9                   | 46.3                  | 25.3                  | 9.0              | 35.0               | 43.8                 | 24.2                   | 14.7                   |
| 25-Nov         | 60.0              | 41.8                   | 43.0                  | 22.5                  | 1.0              | 32.2               | 40.0                 | 22.0                   | 12.3                   |
| 2-Dec          | 56.0              | 39.5                   | 38.6                  | 18.9                  | -4.0             | 28.7               | 36.8                 | 19.6                   | 11.2                   |
| 9-Dec          | 57.0              | 39.6                   | 42.1                  | 21.9                  | -1.0             | 30.8               | 38.0                 | 20.4                   | 12.0                   |
| 16-Dec         | 57.0              | 38.8                   | 39.6                  | 20.2                  | 1.0              | 29.4               | 42.9                 | 19.3                   | 11.0                   |
| 23-Dec         | 54.0              | 37.6                   | 35.5                  | 15.7                  | -22.0            | 31.5               | 43.5                 | 18.1                   | 9.9                    |
| 31-Dec         | 52.0              | 37.5                   | 36.2                  | 15.2                  | -11.0            | 30.8               | 45.3                 | 17.7                   | 9.6                    |

CHEYENNE/F. E. WARREN AFB WY WMO No. 725640

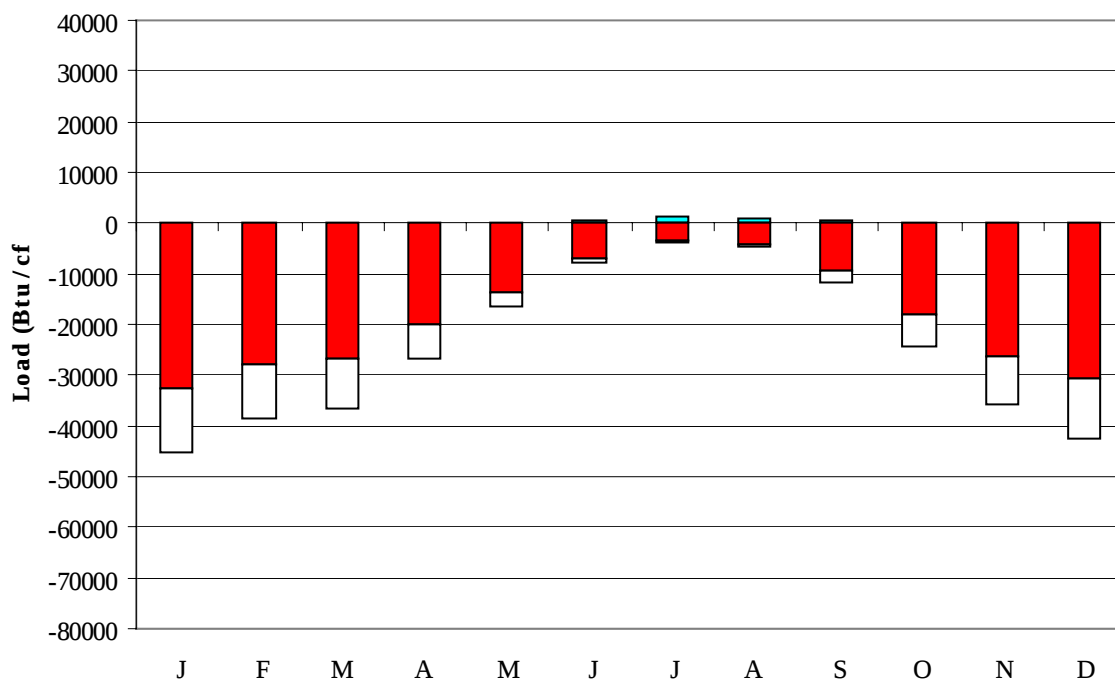
# **Degree Days, Heating and Cooling** (Base 65°F)



■ Mean Cooling Degree Days ■ Mean Heating Degree Days

|     | Mean Cooling<br>Degree Days (°F) | Mean Heating<br>Degree Days (°F) |
|-----|----------------------------------|----------------------------------|
| JAN | 0                                | 1168                             |
| FEB | 0                                | 991                              |
| MAR | 1                                | 941                              |
| APR | 6                                | 682                              |
| MAY | 24                               | 444                              |
| JUN | 91                               | 201                              |
| JUL | 169                              | 92                               |
| AUG | 143                              | 116                              |
| SEP | 64                               | 300                              |
| OCT | 13                               | 608                              |
| NOV | 0                                | 921                              |
| DEC | 0                                | 1096                             |
| ANN | 512                              | 7560                             |

**Average Ventilation and Infiltration Loads**  
**(Outside Air vs. 75°F, 60% RH summer; 68°F, 30% RH winter)**



■ Average Sensible Cooling Load
 ■ Average Sensible Heating Load
 ■ Average Latent Cooling (Drying) Load
 ■ Average Latent Heating (Humidifying) Load

|     | Average Sensible Cooling Load (Btu/cfm) | Average Sensible Heating Load (Btu/cfm) | Average Latent Cooling Load (Btu/cfm) | Average Latent Heating Load (Btu/cfm) |
|-----|-----------------------------------------|-----------------------------------------|---------------------------------------|---------------------------------------|
| JAN | 0                                       | -32676                                  | 0                                     | -12451                                |
| FEB | 0                                       | -27877                                  | 0                                     | -10645                                |
| MAR | 0                                       | -26789                                  | 0                                     | -9815                                 |
| APR | 4                                       | -19907                                  | 0                                     | -6765                                 |
| MAY | 61                                      | -13637                                  | 0                                     | -2615                                 |
| JUN | 599                                     | -6793                                   | 0                                     | -872                                  |
| JUL | 1436                                    | -3570                                   | 8                                     | -295                                  |
| AUG | 1060                                    | -4318                                   | 12                                    | -472                                  |
| SEP | 333                                     | -9537                                   | 0                                     | -2322                                 |
| OCT | 19                                      | -17989                                  | 0                                     | -6467                                 |
| NOV | 0                                       | -26196                                  | 0                                     | -9774                                 |
| DEC | 0                                       | -30750                                  | 0                                     | -11781                                |
| ANN | 3512                                    | -220039                                 | 20                                    | -74274                                |

## Average Annual Solar Radiation – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

City: CHEYENNE  
 State: WY  
 WBAN No: 24018  
 Lat(N): 41.15  
 Long(W): 104.82  
 Elev(ft): 6142

Stn Type: Secondary  
 SHADING GEOMETRY IN DIMENSIONLESS UNITS

Window: 1  
 Overhang: 0.567  
 Vert Gap: 0.325

| AVERAGE INCIDENT SOLAR RADIATION (Btu/sq.ft./day), Percentage Uncertainty = 9 |         | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Year |
|-------------------------------------------------------------------------------|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| HORIZ                                                                         | Global  | 690  | 970  | 1340 | 1690 | 1880 | 2130 | 2110 | 1890 | 1550 | 1150 | 770  | 610  | 1400 |
|                                                                               | Std Dev | 38   | 40   | 66   | 78   | 125  | 150  | 81   | 97   | 108  | 73   | 35   | 36   | 30   |
|                                                                               | Minimum | 600  | 890  | 1200 | 1550 | 1640 | 1860 | 1960 | 1540 | 1340 | 940  | 700  | 550  | 1330 |
|                                                                               | Maximum | 750  | 1040 | 1460 | 1830 | 2100 | 2380 | 2260 | 2020 | 1720 | 1260 | 820  | 690  | 1460 |
|                                                                               | Diffuse | 260  | 360  | 520  | 650  | 750  | 700  | 670  | 600  | 470  | 360  | 290  | 230  | 490  |
| Clear Day                                                                     | Global  | 890  | 1260 | 1780 | 2310 | 2650 | 2780 | 2680 | 2380 | 1930 | 1400 | 970  | 790  | 1820 |
| NORTH                                                                         | Global  | 190  | 250  | 350  | 440  | 560  | 640  | 600  | 480  | 350  | 270  | 200  | 170  | 380  |
|                                                                               | Diffuse | 190  | 250  | 350  | 430  | 490  | 500  | 490  | 430  | 350  | 270  | 200  | 170  | 340  |
| Clear Day                                                                     | Global  | 170  | 220  | 300  | 410  | 590  | 720  | 660  | 470  | 320  | 240  | 180  | 150  | 370  |
| EAST                                                                          | Global  | 500  | 670  | 880  | 1070 | 1170 | 1300 | 1320 | 1220 | 1010 | 790  | 540  | 450  | 910  |
|                                                                               | Diffuse | 230  | 320  | 430  | 520  | 580  | 590  | 580  | 530  | 430  | 340  | 260  | 210  | 420  |
| Clear Day                                                                     | Global  | 710  | 930  | 1220 | 1460 | 1580 | 1610 | 1570 | 1470 | 1270 | 1000 | 750  | 640  | 1190 |
| SOUTH                                                                         | Global  | 1290 | 1370 | 1290 | 1090 | 880  | 830  | 880  | 1050 | 1280 | 1440 | 1300 | 1260 | 1160 |
|                                                                               | Diffuse | 340  | 420  | 500  | 540  | 560  | 540  | 540  | 530  | 480  | 420  | 360  | 310  | 460  |
| Clear Day                                                                     | Global  | 2030 | 2090 | 1930 | 1510 | 1130 | 970  | 1020 | 1310 | 1720 | 2000 | 2020 | 1960 | 1640 |
| WEST                                                                          | Global  | 500  | 660  | 840  | 970  | 1010 | 1090 | 1080 | 1030 | 940  | 770  | 550  | 450  | 830  |
|                                                                               | Diffuse | 240  | 320  | 440  | 530  | 590  | 600  | 590  | 540  | 440  | 340  | 260  | 210  | 420  |
| Clear Day                                                                     | Global  | 710  | 930  | 1220 | 1460 | 1580 | 1610 | 1570 | 1470 | 1270 | 1000 | 750  | 640  | 1190 |

## Average Annual Solar Heat and Illumination – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

| AVERAGE TRANSMITTED SOLAR RADIATION (Btu/sq.ft./day) FOR DOUBLE GLAZING, Percentage Uncertainty = 9 |          | Jan | Feb  | Mar | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov | Dec | Year |
|-----------------------------------------------------------------------------------------------------|----------|-----|------|-----|------|------|------|------|------|------|------|-----|-----|------|
| HORIZ                                                                                               | Unshaded | 430 | 650  | 940 | 1210 | 1360 | 1550 | 1540 | 1370 | 1110 | 790  | 500 | 370 | 990  |
| NORTH                                                                                               | Unshaded | 130 | 170  | 240 | 300  | 360  | 410  | 380  | 310  | 240  | 190  | 140 | 120 | 250  |
|                                                                                                     | Shaded   | 120 | 160  | 210 | 270  | 320  | 360  | 340  | 280  | 220  | 170  | 130 | 100 | 220  |
| EAST                                                                                                | Unshaded | 340 | 470  | 620 | 770  | 840  | 930  | 950  | 880  | 720  | 560  | 380 | 310 | 650  |
|                                                                                                     | Shaded   | 310 | 420  | 540 | 660  | 710  | 780  | 800  | 750  | 630  | 500  | 340 | 280 | 560  |
| SOUTH                                                                                               | Unshaded | 980 | 1010 | 900 | 710  | 550  | 490  | 530  | 660  | 870  | 1040 | 980 | 960 | 810  |
|                                                                                                     | Shaded   | 960 | 940  | 700 | 440  | 340  | 330  | 330  | 380  | 600  | 910  | 950 | 940 | 650  |
| WEST                                                                                                | Unshaded | 340 | 460  | 600 | 690  | 720  | 780  | 770  | 730  | 670  | 540  | 380 | 310 | 580  |
|                                                                                                     | Shaded   | 310 | 410  | 520 | 590  | 610  | 650  | 650  | 620  | 580  | 480  | 340 | 280 | 500  |

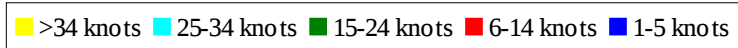
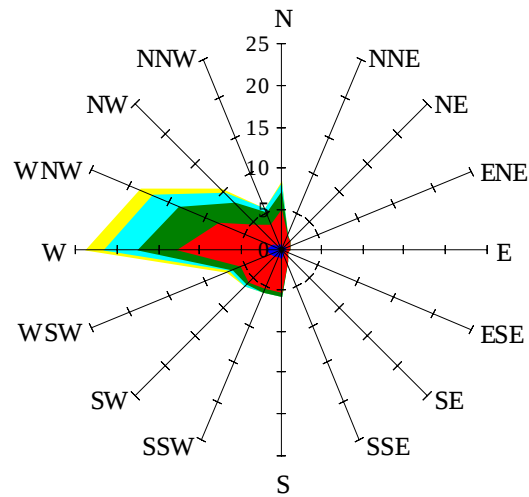
| AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9 |          | March |      |     |     |     | June |      |     |     |     |
|------------------------------------------------------------------------------------------------------------------|----------|-------|------|-----|-----|-----|------|------|-----|-----|-----|
|                                                                                                                  |          | 9am   | 11am | 1pm | 3pm | 5pm | 9am  | 11am | 1pm | 3pm | 5pm |
| HORIZ.                                                                                                           | M.Clear  | 41    | 72   | 80  | 63  | 26  | 52   | 85   | 101 | 95  | 68  |
|                                                                                                                  | M.Cloudy | 28    | 50   | 57  | 44  | 17  | 34   | 62   | 74  | 66  | 46  |
| NORTH                                                                                                            | M.Clear  | 9     | 13   | 14  | 12  | 7   | 17   | 15   | 16  | 16  | 13  |
|                                                                                                                  | M.Cloudy | 10    | 15   | 16  | 14  | 7   | 14   | 17   | 18  | 17  | 14  |
| EAST                                                                                                             | M.Clear  | 80    | 56   | 14  | 12  | 7   | 86   | 71   | 28  | 16  | 13  |
|                                                                                                                  | M.Cloudy | 38    | 35   | 16  | 14  | 7   | 45   | 49   | 26  | 17  | 14  |
| SOUTH                                                                                                            | M.Clear  | 45    | 78   | 85  | 68  | 28  | 11   | 33   | 48  | 43  | 20  |
|                                                                                                                  | M.Cloudy | 24    | 45   | 53  | 41  | 14  | 11   | 28   | 38  | 33  | 18  |
| WEST                                                                                                             | M.Clear  | 9     | 13   | 24  | 69  | 70  | 11   | 15   | 16  | 52  | 80  |
|                                                                                                                  | M.Cloudy | 10    | 15   | 21  | 42  | 28  | 11   | 17   | 18  | 38  | 48  |
| M.Clear                                                                                                          | (% hrs)  | 35    | 35   | 30  | 27  | 29  | 56   | 54   | 46  | 31  | 25  |

|         |          | Sept |      |     |     |     | Dec |      |     |     |     |
|---------|----------|------|------|-----|-----|-----|-----|------|-----|-----|-----|
|         |          | 9am  | 11am | 1pm | 3pm | 5pm | 9am | 11am | 1pm | 3pm | 5pm |
| HORIZ.  | M.Clear  | 31   | 68   | 84  | 77  | 47  | 15  | 40   | 45  | 27  | 0   |
|         | M.Cloudy | 19   | 45   | 59  | 52  | 30  | 10  | 27   | 31  | 18  | 0   |
| NORTH   | M.Clear  | 8    | 13   | 14  | 14  | 10  | 5   | 9    | 10  | 7   | 0   |
|         | M.Cloudy | 7    | 14   | 17  | 15  | 11  | 5   | 9    | 10  | 7   | 0   |
| EAST    | M.Clear  | 77   | 71   | 25  | 14  | 10  | 45  | 39   | 10  | 7   | 0   |
|         | M.Cloudy | 29   | 41   | 22  | 15  | 11  | 18  | 22   | 10  | 7   | 0   |
| SOUTH   | M.Clear  | 25   | 61   | 78  | 71  | 40  | 43  | 87   | 93  | 65  | 1   |
|         | M.Cloudy | 13   | 37   | 50  | 43  | 23  | 17  | 42   | 48  | 28  | 0   |
| WEST    | M.Clear  | 8    | 13   | 14  | 55  | 80  | 5   | 9    | 23  | 51  | 1   |
|         | M.Cloudy | 7    | 14   | 17  | 35  | 39  | 5   | 9    | 16  | 23  | 0   |
| M.Clear | (% hrs)  | 55   | 55   | 53  | 47  | 42  | 36  | 39   | 40  | 41  | 41  |

### Wind Summary - December, January, and February

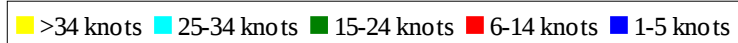
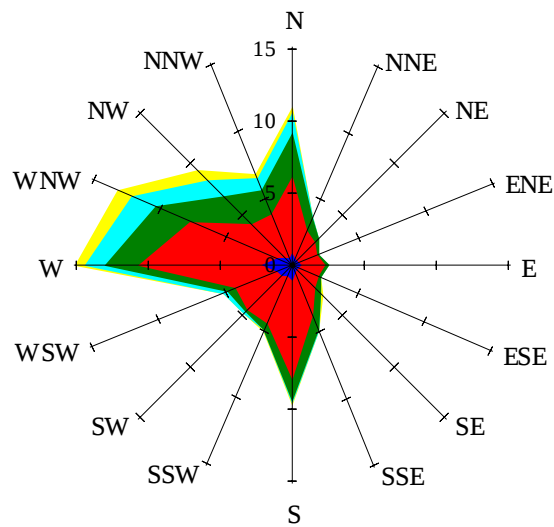
Labels of Percent Frequency on North Axis



Percent Calm = 1.65

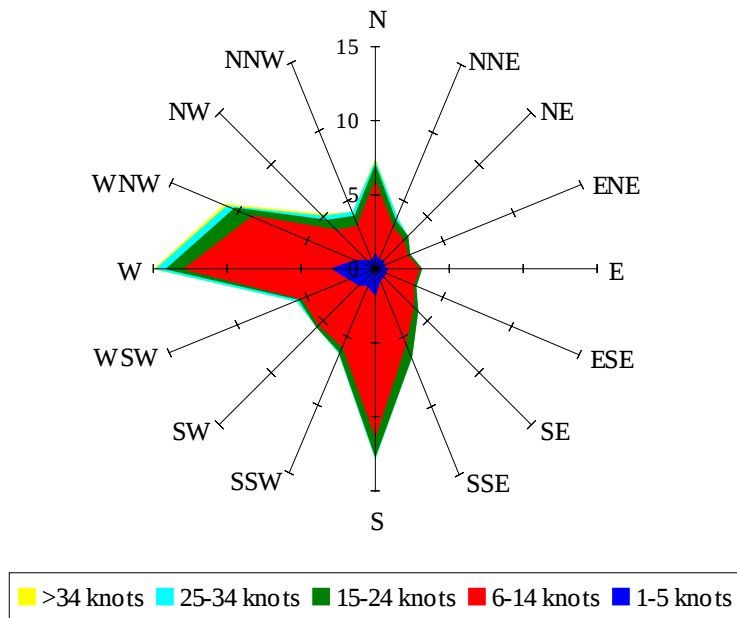
### Wind Summary - March, April, and May

Labels of Percent Frequency on North Axis



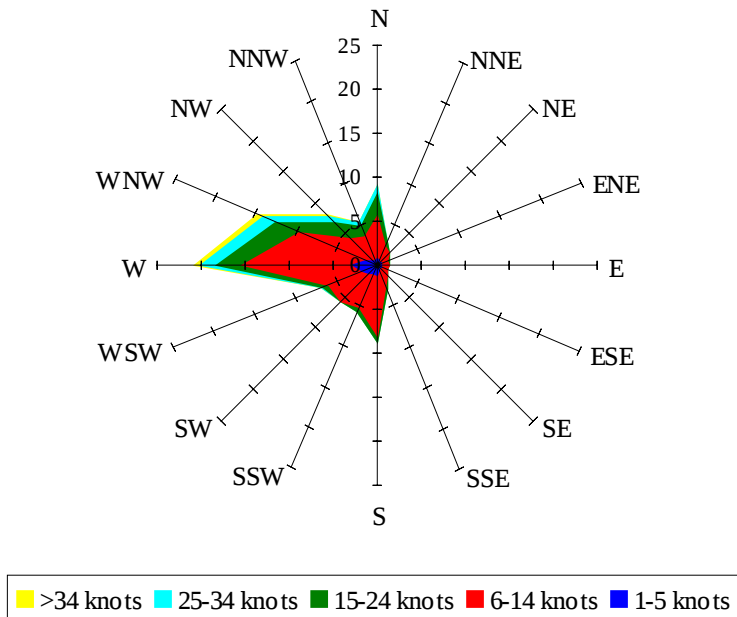
Percent Calm = 1.55

# **Wind Summary - June, July, and August** **Labels of Percent Frequency on North Axis**



Percent Calm = 1.98

# **Wind Summary - September, October, and November** **Labels of Percent Frequency on North Axis**



Percent Calm = 1.76