

|                                 |           |                                    |
|---------------------------------|-----------|------------------------------------|
| <b>MCGRATH</b>                  | <b>AK</b> |                                    |
| Latitude = 62.97 N              |           | WMO No. 702310                     |
| Longitude = 155.60 W            |           | Elevation = 338 feet               |
| Period of Record = 1973 to 1996 |           | Average Pressure = 29.41 inches Hg |

### Design Criteria Data

|                                                  | Design Value      | 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                          | 82                | 62                               | 51                      | 7.9                    | N                           |
| 0.4% Occurrence                                  | 77                | 60                               | 50                      | 7.6                    | N                           |
| 1.0% Occurrence                                  | 73                | 58                               | 49                      | 7.9                    | N                           |
| 2.0% Occurrence                                  | 70                | 57                               | 48                      | 7.6                    | N                           |
| Mean Daily Range                                 | 18                | -                                | -                       | -                      | -                           |
| 97.5% Occurrence                                 | -32               | -32                              | 1                       | 1.8                    | NW                          |
| 99.0% Occurrence                                 | -41               | -41                              | 0                       | 1.3                    | NW                          |
| 99.6% Occurrence                                 | -47               | -47                              | 0                       | 1.2                    | NW                          |
| Median of Extreme Lows                           | -51               | -51                              | 0                       | 1.3                    | NW                          |
|                                                  | Design Value      | 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                | 77                               | 71                      | 7.0                    | S                           |
| 0.4% Occurrence                                  | 62                | 73                               | 64                      | 7.3                    | S                           |
| 1.0% Occurrence                                  | 60                | 70                               | 61                      | 6.9                    | S                           |
| 2.0% Occurrence                                  | 58                | 66                               | 58                      | 6.6                    | S                           |
|                                                  | Design Value      | 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                          | 82                | 67                               | 0.54                    | 6.3                    | S                           |
| 0.4% Occurrence                                  | 71                | 64                               | 0.47                    | 6.3                    | S                           |
| 1.0% Occurrence                                  | 67                | 62                               | 0.45                    | 5.6                    | S                           |
| 2.0% Occurrence                                  | 63                | 61                               | 0.42                    | 5.9                    | 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      |
|                                                  |                   | 0                                | 15                      | 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 |
|-----------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 2                                                   | 0.8                                          | 100                                                                | 0.0 + 0.0                                                                               |
| Ground Water<br>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>(#)                                             |
| 29.8                                                | N/A                                          | N/A                                                                | 55                                                                                      |

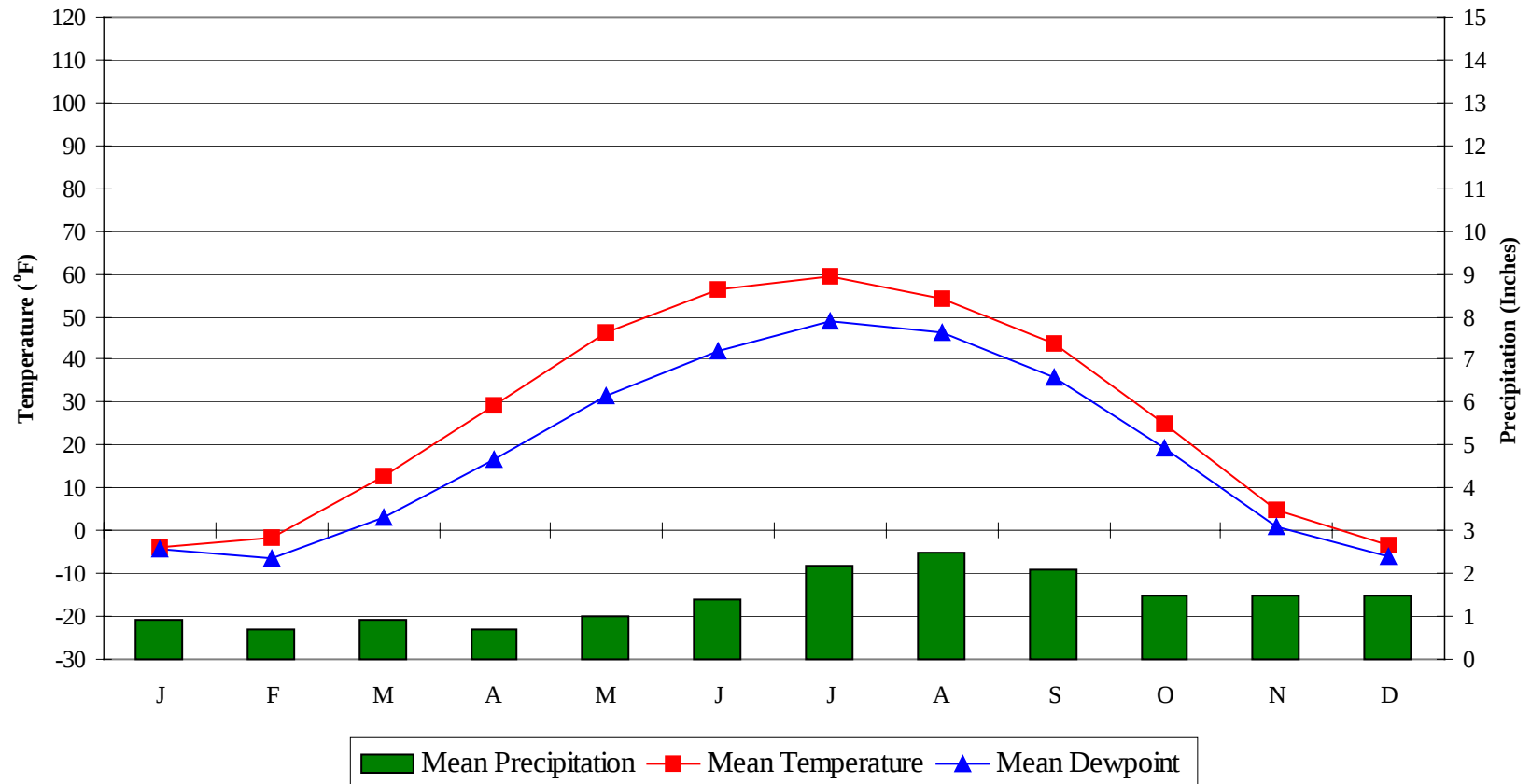
\*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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### Average Annual Climate

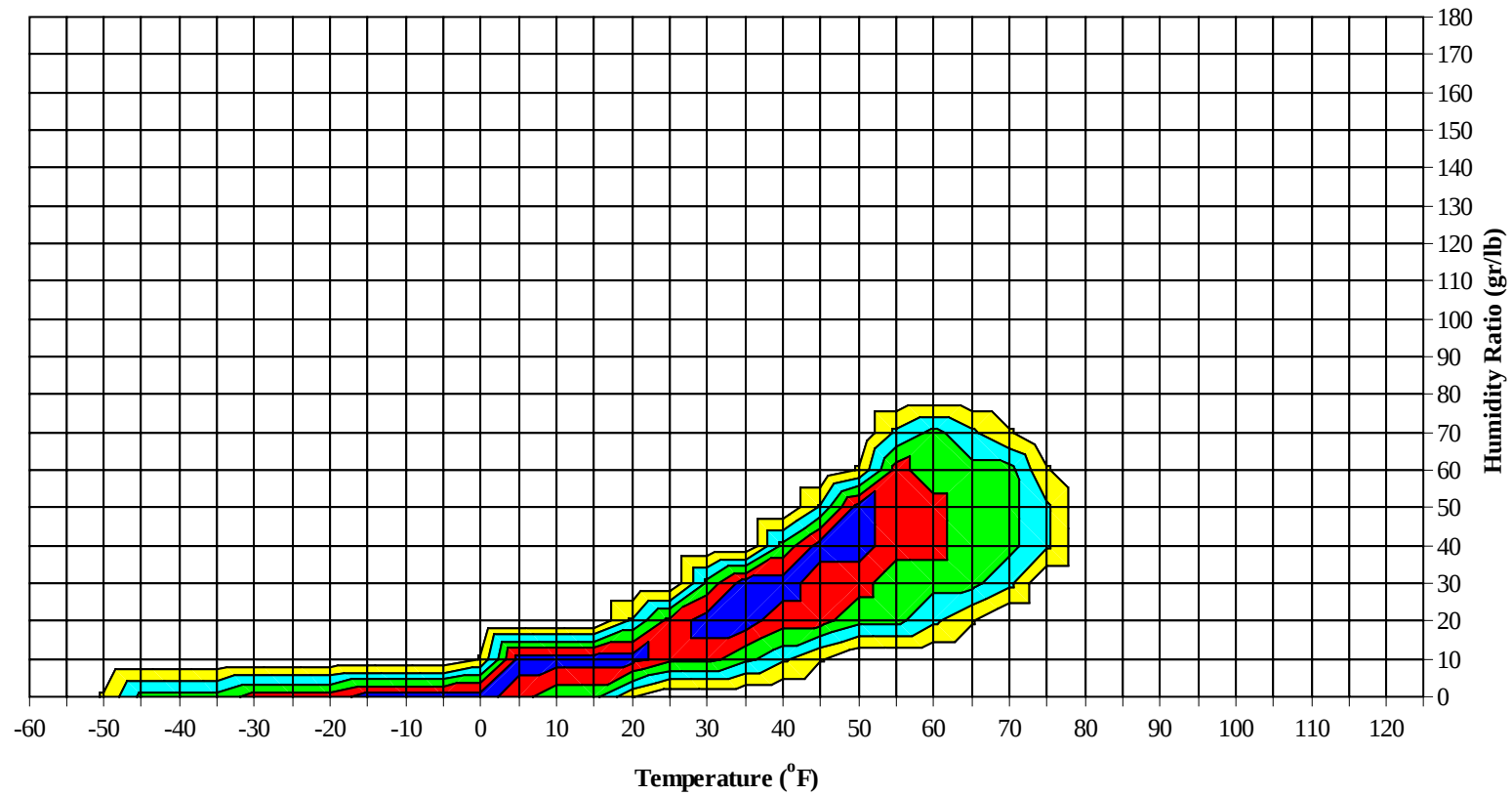


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### Long Term Psychrometric Summary



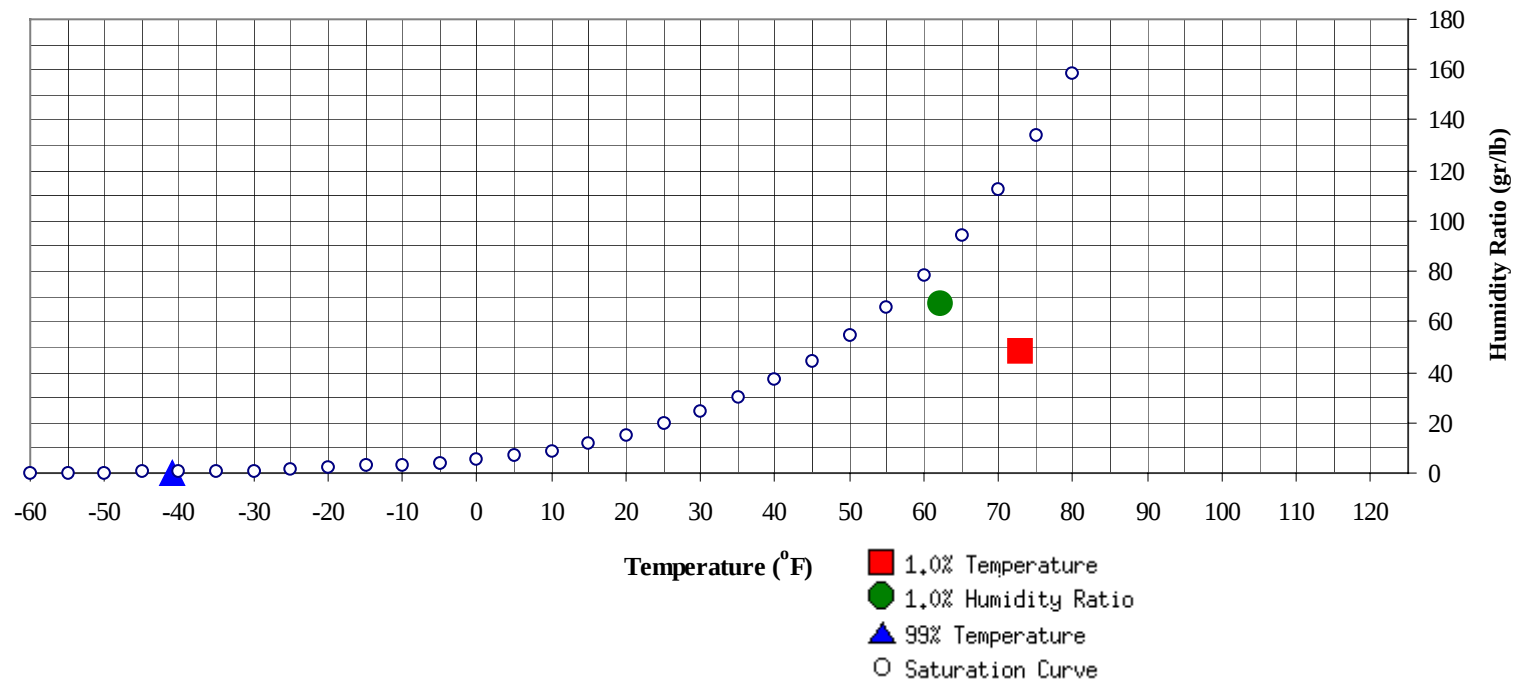
- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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## Psychrometric Summary of Peak Design Values



| 99% Dry Bulb | (°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) |
|--------------|------|-----------------|----------------------|------------------------|---------|--------------|--------------|------------------|----------------------|
|              | -41  | 0.2             | -9.8                 |                        | 67.2    | 62.3         | 58.4         | 55.9             | 25.4                 |

| 1.0% Dry Bulb | (°F) | MCHR<br>(gr/lb) | MCWB<br>(°F) | Enthalpy<br>(btu/lb) |
|---------------|------|-----------------|--------------|----------------------|
|               | 73   | 48.2            | 57.8         | 25.0                 |

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WMO No. 702310

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

Period of Record = 1973 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 |              |                          |
| 85 / 89                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 80 / 84                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 75 / 79                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 70 / 74                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 65 / 69                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 60 / 64                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 55 / 59                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 50 / 54                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 45 / 49                      |                     |                |                |              |                          | 0                   | 1              | 0              | 1            | 37.8                     |                     | 1              | 1              | 2            | 36.4                     |
| 40 / 44                      | 1                   | 1              | 1              | 3            | 34.9                     | 1                   | 2              | 2              | 5            | 35.8                     | 2                   | 9              | 9              | 20           | 34.0                     |
| 35 / 39                      | 4                   | 3              | 4              | 11           | 33.2                     | 3                   | 5              | 5              | 13           | 32.9                     | 6                   | 19             | 20             | 45           | 31.8                     |
| 30 / 34                      | 6                   | 7              | 7              | 20           | 30.1                     | 7                   | 8              | 9              | 24           | 29.7                     | 16                  | 27             | 28             | 71           | 28.4                     |
| 25 / 29                      | 8                   | 7              | 9              | 24           | 25.1                     | 6                   | 11             | 10             | 27           | 25.1                     | 20                  | 27             | 32             | 79           | 24.1                     |
| 20 / 24                      | 11                  | 13             | 9              | 33           | 21.0                     | 11                  | 15             | 13             | 39           | 20.6                     | 19                  | 28             | 30             | 77           | 19.5                     |
| 15 / 19                      | 15                  | 19             | 18             | 52           | 16.0                     | 14                  | 17             | 18             | 49           | 15.9                     | 22                  | 29             | 28             | 79           | 15.0                     |
| 10 / 14                      | 23                  | 23             | 25             | 72           | 11.2                     | 15                  | 17             | 16             | 48           | 10.8                     | 23                  | 26             | 27             | 76           | 10.2                     |
| 5 / 9                        | 22                  | 24             | 22             | 69           | 6.3                      | 17                  | 18             | 21             | 55           | 6.0                      | 21                  | 25             | 23             | 69           | 5.6                      |
| 0 / 4                        | 28                  | 25             | 27             | 81           | 1.3                      | 17                  | 22             | 21             | 59           | 1.0                      | 24                  | 21             | 20             | 65           | 0.8                      |
| -5 / -1                      | 18                  | 18             | 18             | 54           | -2.9                     | 15                  | 18             | 20             | 52           | -3.3                     | 22                  | 12             | 9              | 43           | -3.1                     |
| -10 / -6                     | 19                  | 20             | 23             | 62           | -7.3                     | 19                  | 20             | 21             | 59           | -7.5                     | 22                  | 11             | 10             | 43           | -7.3                     |
| -15 / -11                    | 18                  | 18             | 19             | 55           | -12.0                    | 17                  | 20             | 18             | 55           | -12.3                    | 15                  | 7              | 5              | 27           | -12.0                    |
| -20 / -16                    | 15                  | 16             | 14             | 45           | -16.9                    | 17                  | 15             | 17             | 49           | -17.0                    | 14                  | 4              | 3              | 21           | -17.0                    |
| -25 / -21                    | 11                  | 12             | 11             | 34           | -22.0                    | 18                  | 13             | 12             | 43           | -21.9                    | 11                  | 3              | 2              | 16           | -21.8                    |
| -30 / -26                    | 10                  | 10             | 10             | 30           | -26.9                    | 12                  | 9              | 7              | 28           | -26.8                    | 6                   | 1              | 1              | 8            | -26.8                    |
| -35 / -31                    | 8                   | 9              | 7              | 24           | -31.9                    | 11                  | 6              | 6              | 23           | -31.9                    | 4                   | 1              | 0              | 5            | -32.0                    |
| -40 / -36                    | 9                   | 7              | 8              | 24           | -36.0                    | 10                  | 5              | 3              | 18           | -36.1                    | 2                   | 0              | 0              | 2            | -35.7                    |
| -45 / -41                    | 6                   | 6              | 7              | 19           | -41.8                    | 8                   | 4              | 2              | 14           | -41.0                    | 0                   | 0              |                | 0            | -41.0                    |
| -50 / -46                    | 8                   | 7              | 5              | 20           | -46.0                    | 5                   | 2              | 1              | 8            | -46.0                    | 0                   | 0              |                | 0            | -46.0                    |
| -55 / -51                    | 3                   | 3              | 1              | 7            |                          | 1                   | 1              | 0              | 2            |                          |                     |                |                |              |                          |
| -60 / -56                    | 4                   | 2              | 0              | 6            |                          | 0                   | 0              |                | 0            |                          |                     |                |                |              |                          |
| -65 / -61                    | 1                   | 1              |                | 2            |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -70 / -66                    | 0                   | 0              |                | 0            |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -75 / -71                    | 0                   | 0              |                | 0            |                          |                     |                |                |              |                          |                     |                |                |              |                          |

**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.

MCGRATH

AK

WMO No. 702310

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

Period of Record = 1973 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 |              |                          |
| 85 / 89                      |                     |                |                |              |                          |                     |                |                |              |                          |                     | 0              | 0              | 0            | 61.6                     |
| 80 / 84                      |                     |                |                |              |                          |                     |                | 0              | 0            | 57.8                     |                     | 2              | 1              | 3            | 60.6                     |
| 75 / 79                      |                     |                |                |              |                          |                     | 1              | 1              | 2            | 55.6                     |                     | 6              | 7              | 13           | 57.8                     |
| 70 / 74                      |                     |                |                |              |                          |                     | 4              | 5              | 9            | 53.3                     | 0                   | 22             | 20             | 42           | 55.8                     |
| 65 / 69                      |                     |                |                |              |                          |                     | 11             | 10             | 21           | 50.6                     | 1                   | 42             | 36             | 79           | 53.6                     |
| 60 / 64                      |                     | 0              | 0              | 0            | 44.2                     | 0                   | 26             | 21             | 47           | 48.2                     | 6                   | 56             | 50             | 112          | 51.8                     |
| 55 / 59                      |                     | 2              | 2              | 4            | 42.5                     | 2                   | 44             | 41             | 87           | 45.7                     | 29                  | 51             | 57             | 137          | 49.8                     |
| 50 / 54                      |                     | 11             | 9              | 20           | 40.2                     | 13                  | 52             | 51             | 116          | 43.5                     | 74                  | 40             | 47             | 161          | 47.5                     |
| 45 / 49                      | 0                   | 22             | 21             | 43           | 37.6                     | 39                  | 46             | 49             | 134          | 41.2                     | 82                  | 20             | 18             | 120          | 44.4                     |
| 40 / 44                      | 4                   | 44             | 41             | 89           | 35.1                     | 61                  | 34             | 37             | 132          | 37.9                     | 39                  | 3              | 3              | 45           | 40.4                     |
| 35 / 39                      | 25                  | 50             | 53             | 128          | 32.2                     | 69                  | 21             | 23             | 112          | 34.2                     | 8                   | 0              | 0              | 8            | 35.7                     |
| 30 / 34                      | 52                  | 35             | 42             | 129          | 28.7                     | 45                  | 6              | 7              | 58           | 29.9                     | 1                   |                |                | 1            | 31.3                     |
| 25 / 29                      | 47                  | 23             | 24             | 94           | 24.3                     | 12                  | 2              | 2              | 16           | 24.8                     |                     |                |                |              |                          |
| 20 / 24                      | 34                  | 19             | 16             | 69           | 19.5                     | 4                   | 1              | 1              | 6            | 19.8                     |                     |                |                |              |                          |
| 15 / 19                      | 23                  | 14             | 12             | 49           | 15.0                     | 1                   | 1              | 0              | 2            | 14.8                     |                     |                |                |              |                          |
| 10 / 14                      | 15                  | 9              | 8              | 32           | 10.2                     | 1                   | 0              |                | 1            | 10.3                     |                     |                |                |              |                          |
| 5 / 9                        | 11                  | 5              | 5              | 21           | 5.7                      | 0                   |                |                | 0            | 7.0                      |                     |                |                |              |                          |
| 0 / 4                        | 9                   | 4              | 3              | 16           | 1.0                      |                     |                |                |              |                          |                     |                |                |              |                          |
| -5 / -1                      | 5                   | 2              | 1              | 8            | -3.2                     |                     |                |                |              |                          |                     |                |                |              |                          |
| -10 / -6                     | 6                   | 1              | 1              | 8            | -7.4                     |                     |                |                |              |                          |                     |                |                |              |                          |
| -15 / -11                    | 4                   | 0              | 0              | 4            | -11.9                    |                     |                |                |              |                          |                     |                |                |              |                          |
| -20 / -16                    | 3                   | 0              | 0              | 3            | -16.6                    |                     |                |                |              |                          |                     |                |                |              |                          |
| -25 / -21                    | 1                   | 0              | 0              | 1            | -21.5                    |                     |                |                |              |                          |                     |                |                |              |                          |
| -30 / -26                    | 1                   | 0              | 0              | 1            | -27.0                    |                     |                |                |              |                          |                     |                |                |              |                          |
| -35 / -31                    | 0                   |                |                | 0            | -31.5                    |                     |                |                |              |                          |                     |                |                |              |                          |
| -40 / -36                    | 0                   |                |                | 0            |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -45 / -41                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -50 / -46                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -55 / -51                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -60 / -56                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -65 / -61                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -70 / -66                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -75 / -71                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |

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MCGRATH

AK

WMO No. 702310

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

Period of Record = 1973 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 |              |                          |
| 85 / 89                      |                     | 0              | 0              | 0            | 62.7                     |                     | 0              | 0              | 0            | 66.0                     |                     |                |                |              |                          |
| 80 / 84                      |                     | 5              | 5              | 10           | 62.0                     |                     | 0              | 0              | 0            | 63.9                     |                     |                |                |              |                          |
| 75 / 79                      |                     | 14             | 12             | 26           | 60.4                     |                     | 4              | 4              | 8            | 61.0                     |                     |                |                |              |                          |
| 70 / 74                      | 0                   | 33             | 29             | 62           | 58.5                     | 0                   | 14             | 11             | 25           | 59.1                     |                     | 1              | 1              | 2            | 55.6                     |
| 65 / 69                      | 3                   | 49             | 43             | 95           | 56.9                     | 0                   | 25             | 22             | 47           | 56.7                     | 0                   | 4              | 3              | 7            | 52.8                     |
| 60 / 64                      | 18                  | 57             | 59             | 134          | 55.3                     | 7                   | 50             | 47             | 104          | 55.1                     | 1                   | 11             | 9              | 21           | 50.9                     |
| 55 / 59                      | 71                  | 54             | 61             | 186          | 53.2                     | 34                  | 66             | 65             | 165          | 52.8                     | 2                   | 27             | 21             | 50           | 49.0                     |
| 50 / 54                      | 97                  | 32             | 34             | 163          | 49.9                     | 78                  | 58             | 65             | 201          | 49.4                     | 13                  | 47             | 45             | 105          | 46.8                     |
| 45 / 49                      | 50                  | 4              | 5              | 59           | 46.0                     | 71                  | 23             | 26             | 120          | 45.3                     | 43                  | 54             | 59             | 156          | 43.8                     |
| 40 / 44                      | 9                   | 0              | 0              | 9            | 41.9                     | 35                  | 7              | 6              | 48           | 40.6                     | 62                  | 44             | 49             | 154          | 39.6                     |
| 35 / 39                      | 1                   | 0              | 0              | 1            | 36.9                     | 16                  | 1              | 2              | 19           | 35.8                     | 53                  | 30             | 32             | 115          | 34.8                     |
| 30 / 34                      | 0                   |                |                | 0            | 33.5                     | 6                   | 0              | 0              | 6            | 31.4                     | 42                  | 14             | 16             | 72           | 30.5                     |
| 25 / 29                      |                     |                |                |              |                          | 1                   |                |                | 1            | 27.0                     | 13                  | 5              | 6              | 24           | 25.5                     |
| 20 / 24                      |                     |                |                |              |                          |                     |                |                |              |                          | 7                   | 2              | 1              | 10           | 20.7                     |
| 15 / 19                      |                     |                |                |              |                          |                     |                |                |              |                          | 2                   | 0              | 0              | 2            | 15.9                     |
| 10 / 14                      |                     |                |                |              |                          |                     |                |                |              |                          | 1                   | 0              | 0              | 1            | 11.4                     |
| 5 / 9                        |                     |                |                |              |                          |                     |                |                |              |                          | 0                   | 0              |                | 0            | 6.4                      |
| 0 / 4                        |                     |                |                |              |                          |                     |                |                |              |                          | 0                   |                |                | 0            | 3.0                      |
| -5 / -1                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -10 / -6                     |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -15 / -11                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -20 / -16                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -25 / -21                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -30 / -26                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -35 / -31                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -40 / -36                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -45 / -41                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -50 / -46                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -55 / -51                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -60 / -56                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -65 / -61                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -70 / -66                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -75 / -71                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |

**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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WMO No. 702310

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

Period of Record = 1973 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 |              |                          |
| 85 / 89                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 80 / 84                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 75 / 79                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 70 / 74                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 65 / 69                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 60 / 64                      |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| 55 / 59                      |                     | 0              | 0              | 0            | 45.7                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 50 / 54                      | 0                   | 3              | 1              | 4            | 43.8                     |                     |                |                |              |                          |                     |                |                |              |                          |
| 45 / 49                      | 2                   | 7              | 7              | 16           | 41.7                     | 0                   | 0              | 0              | 0            | 38.2                     |                     |                | 0              | 0            | 35.0                     |
| 40 / 44                      | 10                  | 18             | 17             | 45           | 38.7                     | 1                   | 1              | 2              | 4            | 37.1                     | 1                   | 0              | 1              | 2            | 35.3                     |
| 35 / 39                      | 21                  | 32             | 30             | 83           | 34.2                     | 5                   | 6              | 5              | 16           | 34.2                     | 3                   | 4              | 3              | 10           | 33.6                     |
| 30 / 34                      | 47                  | 49             | 50             | 146          | 30.1                     | 11                  | 13             | 11             | 35           | 30.3                     | 5                   | 7              | 6              | 18           | 30.2                     |
| 25 / 29                      | 42                  | 40             | 43             | 125          | 25.3                     | 11                  | 15             | 13             | 39           | 25.6                     | 9                   | 10             | 8              | 27           | 25.5                     |
| 20 / 24                      | 37                  | 35             | 36             | 108          | 20.6                     | 15                  | 16             | 19             | 50           | 20.9                     | 13                  | 14             | 11             | 38           | 21.0                     |
| 15 / 19                      | 30                  | 27             | 27             | 84           | 16.2                     | 20                  | 22             | 21             | 63           | 16.1                     | 16                  | 15             | 18             | 49           | 16.3                     |
| 10 / 14                      | 21                  | 15             | 16             | 52           | 11.2                     | 25                  | 27             | 28             | 80           | 11.2                     | 18                  | 18             | 23             | 59           | 11.3                     |
| 5 / 9                        | 15                  | 9              | 10             | 34           | 6.6                      | 27                  | 30             | 29             | 86           | 6.2                      | 19                  | 21             | 21             | 61           | 6.4                      |
| 0 / 4                        | 9                   | 5              | 5              | 19           | 1.4                      | 30                  | 35             | 30             | 95           | 1.4                      | 27                  | 25             | 24             | 76           | 1.2                      |
| -5 / -1                      | 6                   | 3              | 3              | 12           | -2.8                     | 19                  | 16             | 18             | 53           | -2.9                     | 19                  | 19             | 19             | 57           | -2.9                     |
| -10 / -6                     | 4                   | 2              | 2              | 8            | -7.0                     | 22                  | 20             | 22             | 64           | -7.2                     | 22                  | 25             | 21             | 68           | -7.2                     |
| -15 / -11                    | 3                   | 1              | 1              | 5            | -11.8                    | 16                  | 14             | 16             | 46           | -12.0                    | 21                  | 19             | 19             | 59           | -12.0                    |
| -20 / -16                    | 1                   | 1              | 0              | 2            | -16.1                    | 13                  | 10             | 12             | 35           | -16.9                    | 14                  | 18             | 19             | 51           | -16.9                    |
| -25 / -21                    | 0                   | 0              | 0              | 0            | -21.5                    | 11                  | 8              | 6              | 25           | -21.8                    | 16                  | 14             | 18             | 48           | -21.9                    |
| -30 / -26                    | 0                   |                |                | 0            | -26.8                    | 5                   | 4              | 4              | 13           | -26.9                    | 15                  | 14             | 14             | 43           | -27.0                    |
| -35 / -31                    |                     |                |                |              |                          | 4                   | 3              | 2              | 9            | -31.6                    | 13                  | 11             | 8              | 32           | -31.9                    |
| -40 / -36                    |                     |                |                |              |                          | 2                   | 1              | 1              | 4            | -36.5                    | 6                   | 7              | 7              | 20           | -36.2                    |
| -45 / -41                    |                     |                |                |              |                          | 1                   | 0              | 1              | 2            | -42.3                    | 7                   | 5              | 6              | 18           | -42.3                    |
| -50 / -46                    |                     |                |                |              |                          | 0                   | 0              | 0              | 0            |                          | 3                   | 2              | 2              | 7            | -47.8                    |
| -55 / -51                    |                     |                |                |              |                          |                     | 0              |                | 0            |                          | 1                   | 0              | 0              | 1            | -51.0                    |
| -60 / -56                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -65 / -61                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -70 / -66                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |
| -75 / -71                    |                     |                |                |              |                          |                     |                |                |              |                          |                     |                |                |              |                          |

**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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WMO No. 702310

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

Period of Record = 1973 to 1996

| Annual Totals                |                     |                |                |              |                          |
|------------------------------|---------------------|----------------|----------------|--------------|--------------------------|
| Temperature<br>Range<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 |              |                          |
| 85 / 89                      |                     | 0              | 1              | 1            | 62.8                     |
| 80 / 84                      |                     | 7              | 7              | 14           | 61.7                     |
| 75 / 79                      |                     | 25             | 24             | 49           | 59.6                     |
| 70 / 74                      | 0                   | 75             | 66             | 141          | 57.4                     |
| 65 / 69                      | 4                   | 130            | 115            | 250          | 55.2                     |
| 60 / 64                      | 32                  | 201            | 188            | 421          | 53.3                     |
| 55 / 59                      | 138                 | 245            | 249            | 632          | 50.9                     |
| 50 / 54                      | 277                 | 243            | 255            | 775          | 47.6                     |
| 45 / 49                      | 288                 | 178            | 188            | 654          | 43.3                     |
| 40 / 44                      | 225                 | 163            | 169            | 557          | 38.3                     |
| 35 / 39                      | 214                 | 172            | 180            | 566          | 33.7                     |
| 30 / 34                      | 240                 | 164            | 179            | 583          | 29.6                     |
| 25 / 29                      | 169                 | 139            | 148            | 457          | 24.9                     |
| 20 / 24                      | 150                 | 142            | 136            | 429          | 20.3                     |
| 15 / 19                      | 143                 | 143            | 142            | 429          | 15.8                     |
| 10 / 14                      | 142                 | 134            | 141            | 418          | 10.9                     |
| 5 / 9                        | 131                 | 131            | 127            | 390          | 6.1                      |
| 0 / 4                        | 143                 | 136            | 127            | 407          | 1.2                      |
| -5 / -1                      | 103                 | 87             | 86             | 276          | -3.0                     |
| -10 / -6                     | 112                 | 99             | 96             | 307          | -7.3                     |
| -15 / -11                    | 94                  | 77             | 77             | 248          | -12.0                    |
| -20 / -16                    | 77                  | 63             | 65             | 205          | -16.9                    |
| -25 / -21                    | 67                  | 49             | 49             | 165          | -21.9                    |
| -30 / -26                    | 48                  | 38             | 36             | 122          | -26.9                    |
| -35 / -31                    | 41                  | 28             | 24             | 93           | -31.9                    |
| -40 / -36                    | 29                  | 20             | 19             | 68           | -36.1                    |
| -45 / -41                    | 23                  | 14             | 15             | 52           | -41.9                    |
| -50 / -46                    | 16                  | 10             | 7              | 33           | -46.7                    |
| -55 / -51                    | 6                   | 4              | 2              | 12           | -51.0                    |
| -60 / -56                    | 4                   | 2              | 0              | 6            |                          |
| -65 / -61                    | 1                   | 0              |                | 1            |                          |
| -70 / -66                    | 0                   | 0              |                | 0            |                          |
| -75 / -71                    | 0                   | 0              |                | 0            |                          |

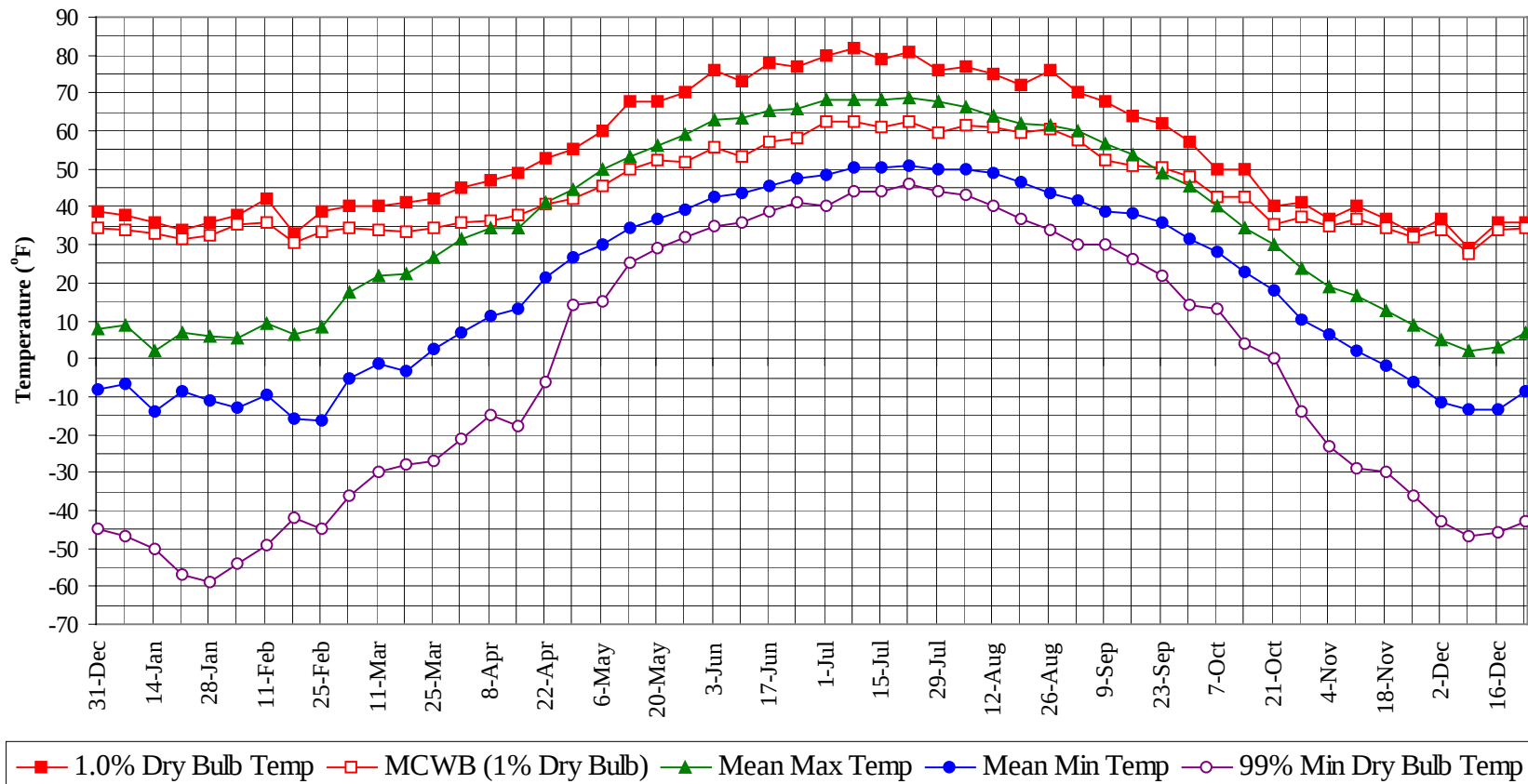
**Caution:** This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity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

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### Annual Summary of Temperatures

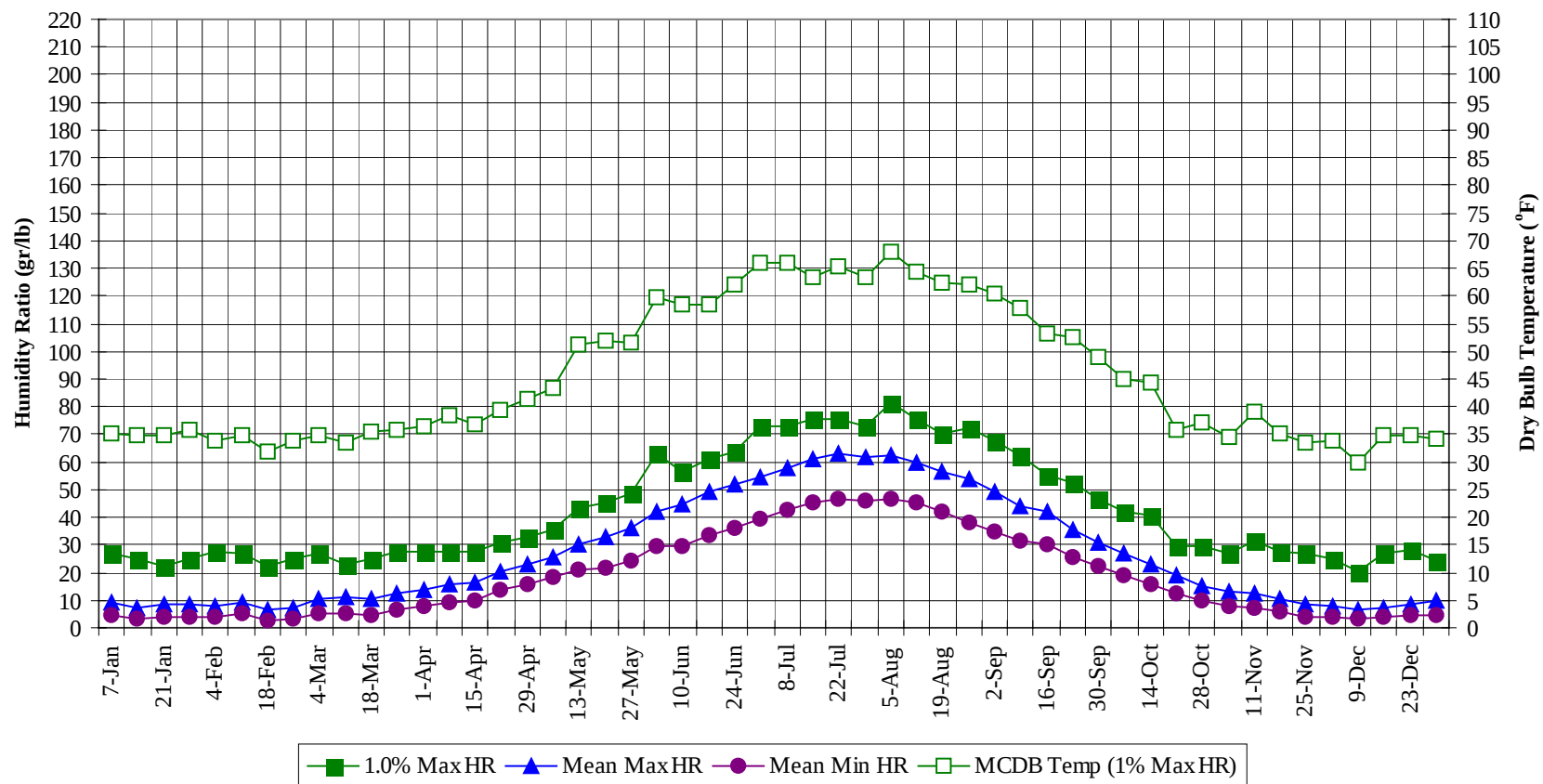


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### Long Term Humidity and Dry Bulb Temperature Summary



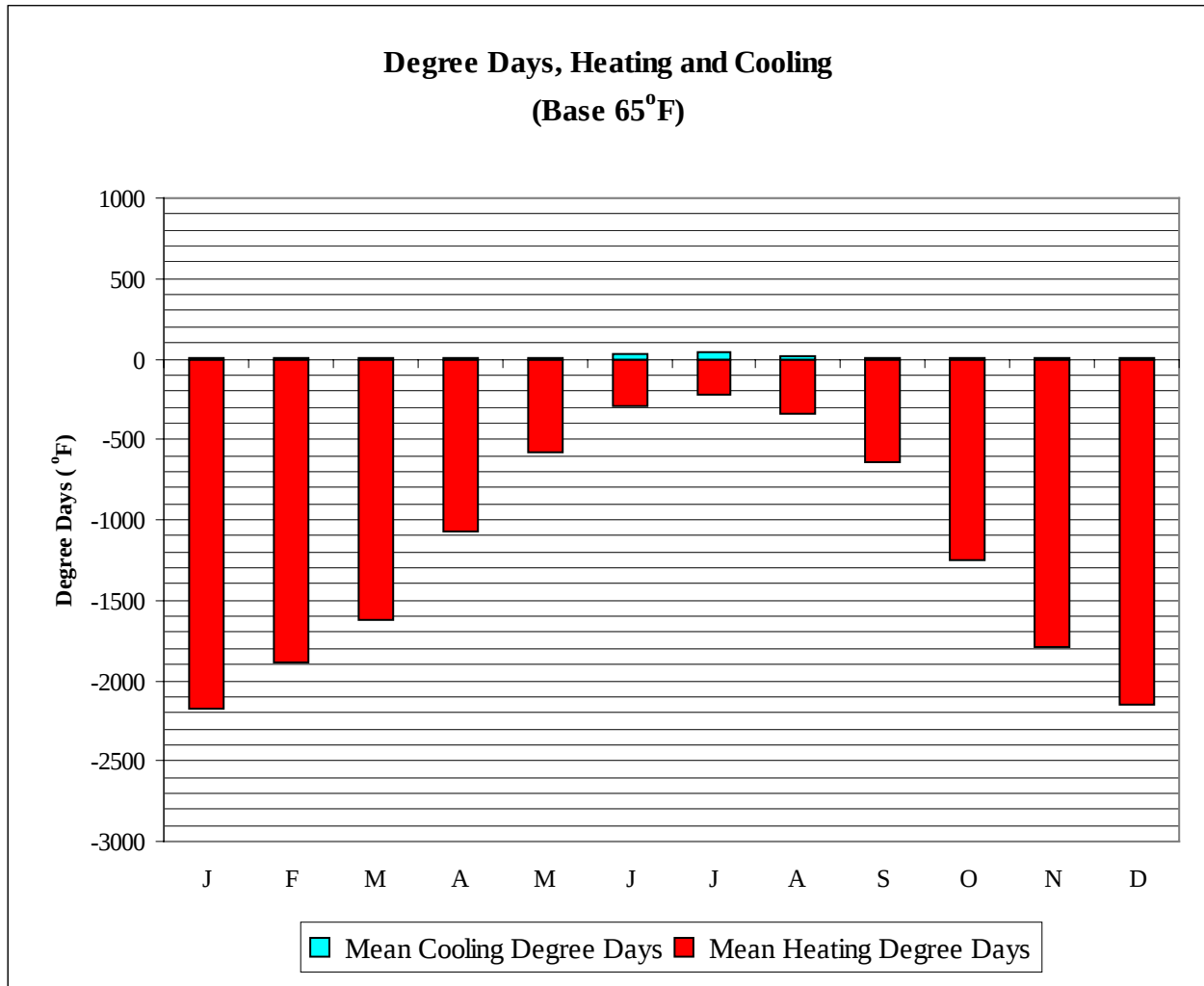
**MCGRATH****AK****WMO No. 702310****Long Term Dry Bulb Temperature and Humidity Summary**

| Week Ending | 1.0% Temp (°F) | MCWB @ 1% Temp (°F) | Mean Max Temp (°F) | Mean Min Temp (°F) | 99% Temp (°F) | 1.0% HR (gr/lb) | MCDB @ 1% HR (°F) | Mean Max HR (gr/lb) | Mean Min HR (gr/lb) |
|-------------|----------------|---------------------|--------------------|--------------------|---------------|-----------------|-------------------|---------------------|---------------------|
| 7-Jan       | 38.0           | 33.7                | 8.9                | -6.6               | -47.0         | 26.6            | 35.3              | 9.3                 | 4.8                 |
| 14-Jan      | 36.0           | 33.0                | 2.0                | -14.1              | -50.0         | 25.2            | 34.8              | 7.1                 | 3.6                 |
| 21-Jan      | 34.0           | 31.5                | 6.8                | -8.7               | -57.0         | 22.4            | 34.7              | 8.4                 | 4.1                 |
| 28-Jan      | 36.0           | 32.5                | 6.0                | -11.2              | -59.0         | 25.2            | 35.9              | 8.2                 | 4.1                 |
| 4-Feb       | 38.0           | 35.4                | 5.4                | -12.9              | -54.0         | 27.3            | 33.8              | 8.1                 | 4.1                 |
| 11-Feb      | 42.0           | 35.7                | 9.2                | -9.8               | -49.0         | 26.6            | 34.8              | 9.3                 | 5.0                 |
| 18-Feb      | 33.0           | 30.7                | 6.6                | -15.7              | -42.0         | 22.4            | 31.8              | 6.8                 | 3.0                 |
| 25-Feb      | 39.0           | 33.5                | 8.2                | -16.1              | -45.0         | 25.2            | 33.8              | 7.2                 | 3.0                 |
| 4-Mar       | 40.0           | 34.2                | 17.7               | -5.0               | -36.0         | 26.6            | 34.7              | 10.4                | 5.1                 |
| 11-Mar      | 40.0           | 33.8                | 21.8               | -1.4               | -30.0         | 23.1            | 33.4              | 11.0                | 5.5                 |
| 18-Mar      | 41.0           | 33.7                | 22.5               | -3.3               | -28.0         | 25.2            | 35.4              | 10.8                | 4.8                 |
| 25-Mar      | 42.0           | 34.2                | 26.8               | 2.3                | -27.0         | 27.3            | 35.8              | 12.5                | 6.7                 |
| 1-Apr       | 45.0           | 35.8                | 31.3               | 6.9                | -21.0         | 27.3            | 36.5              | 13.8                | 7.9                 |
| 8-Apr       | 47.0           | 36.6                | 34.3               | 11.4               | -15.0         | 27.3            | 38.4              | 15.5                | 8.9                 |
| 15-Apr      | 49.0           | 37.8                | 34.5               | 13.2               | -18.0         | 27.3            | 36.9              | 16.2                | 9.6                 |
| 22-Apr      | 53.0           | 40.8                | 41.2               | 21.2               | -6.0          | 30.8            | 39.5              | 20.3                | 13.6                |
| 29-Apr      | 55.0           | 41.9                | 44.8               | 26.8               | 14.0          | 32.9            | 41.4              | 22.9                | 15.8                |
| 6-May       | 60.0           | 45.6                | 49.7               | 30.0               | 15.0          | 35.7            | 43.3              | 25.9                | 18.3                |
| 13-May      | 68.0           | 50.1                | 53.1               | 34.4               | 25.0          | 43.4            | 51.1              | 30.3                | 21.2                |
| 20-May      | 68.0           | 52.1                | 56.1               | 36.9               | 29.0          | 45.5            | 51.9              | 32.9                | 21.9                |
| 27-May      | 70.0           | 51.8                | 58.9               | 39.1               | 32.0          | 48.3            | 51.7              | 36.1                | 24.5                |
| 3-Jun       | 76.0           | 55.9                | 62.8               | 42.8               | 35.0          | 63.0            | 59.9              | 42.2                | 29.4                |
| 10-Jun      | 73.0           | 53.3                | 63.2               | 43.8               | 36.0          | 56.7            | 58.5              | 44.4                | 29.8                |
| 17-Jun      | 78.0           | 57.0                | 65.4               | 45.7               | 39.0          | 60.9            | 58.5              | 49.1                | 33.7                |
| 24-Jun      | 77.0           | 58.0                | 66.0               | 47.4               | 41.0          | 63.7            | 62.0              | 52.2                | 36.4                |
| 1-Jul       | 80.0           | 62.3                | 68.2               | 48.3               | 40.0          | 72.8            | 66.1              | 54.7                | 39.3                |
| 8-Jul       | 82.0           | 62.2                | 68.2               | 50.4               | 44.0          | 72.8            | 66.1              | 57.8                | 42.7                |
| 15-Jul      | 79.0           | 61.0                | 68.2               | 50.6               | 44.0          | 75.6            | 63.2              | 61.0                | 45.2                |
| 22-Jul      | 81.0           | 62.7                | 68.8               | 50.8               | 46.0          | 75.6            | 65.5              | 63.3                | 46.8                |
| 29-Jul      | 76.0           | 59.4                | 67.5               | 50.0               | 44.0          | 72.8            | 63.4              | 62.0                | 46.3                |
| 5-Aug       | 77.0           | 61.6                | 66.5               | 50.1               | 43.0          | 81.2            | 67.8              | 62.4                | 46.5                |
| 12-Aug      | 75.0           | 61.0                | 64.0               | 48.7               | 40.0          | 75.6            | 64.5              | 59.6                | 45.3                |
| 19-Aug      | 72.0           | 59.4                | 62.1               | 46.5               | 37.0          | 70.0            | 62.3              | 56.6                | 41.8                |
| 26-Aug      | 76.0           | 60.5                | 61.5               | 43.6               | 34.0          | 72.1            | 62.1              | 54.0                | 37.9                |
| 2-Sep       | 70.0           | 57.5                | 60.0               | 41.5               | 30.0          | 67.9            | 60.4              | 49.4                | 35.0                |
| 9-Sep       | 68.0           | 52.3                | 56.7               | 38.9               | 30.0          | 62.3            | 57.7              | 43.9                | 31.5                |
| 16-Sep      | 64.0           | 51.1                | 53.6               | 38.3               | 26.0          | 55.3            | 53.2              | 41.7                | 30.0                |
| 23-Sep      | 62.0           | 50.3                | 49.2               | 35.8               | 22.0          | 52.5            | 52.4              | 35.5                | 25.8                |
| 30-Sep      | 57.0           | 48.1                | 45.6               | 31.4               | 14.0          | 46.9            | 48.8              | 31.0                | 22.2                |
| 7-Oct       | 50.0           | 42.7                | 40.3               | 27.9               | 13.0          | 42.0            | 44.8              | 26.9                | 19.4                |
| 14-Oct      | 50.0           | 42.7                | 34.4               | 22.9               | 4.0           | 40.6            | 44.3              | 23.0                | 15.9                |
| 21-Oct      | 40.0           | 35.2                | 29.9               | 17.9               | 0.0           | 29.4            | 35.7              | 18.8                | 12.4                |
| 28-Oct      | 41.0           | 37.1                | 23.6               | 10.3               | -14.0         | 29.4            | 37.1              | 15.0                | 9.7                 |
| 4-Nov       | 37.0           | 34.7                | 18.8               | 6.1                | -23.0         | 26.6            | 34.6              | 12.9                | 8.0                 |
| 11-Nov      | 40.0           | 37.1                | 16.3               | 2.0                | -29.0         | 31.5            | 39.2              | 12.3                | 6.9                 |
| 18-Nov      | 37.0           | 34.6                | 12.8               | -1.6               | -30.0         | 27.3            | 35.2              | 10.8                | 5.7                 |
| 25-Nov      | 33.0           | 32.0                | 8.7                | -6.4               | -36.0         | 26.6            | 33.6              | 8.5                 | 4.2                 |
| 2-Dec       | 37.0           | 34.0                | 5.2                | -11.6              | -43.0         | 25.2            | 33.9              | 7.9                 | 3.7                 |
| 9-Dec       | 29.0           | 27.6                | 1.9                | -13.6              | -47.0         | 20.3            | 29.8              | 6.6                 | 3.3                 |
| 16-Dec      | 36.0           | 33.9                | 2.9                | -13.3              | -46.0         | 26.6            | 34.9              | 7.5                 | 3.8                 |
| 23-Dec      | 36.0           | 34.3                | 6.8                | -8.7               | -43.0         | 28.0            | 34.7              | 8.8                 | 4.6                 |
| 31-Dec      | 39.0           | 34.6                | 7.8                | -8.2               | -45.0         | 24.5            | 34.1              | 9.5                 | 4.5                 |

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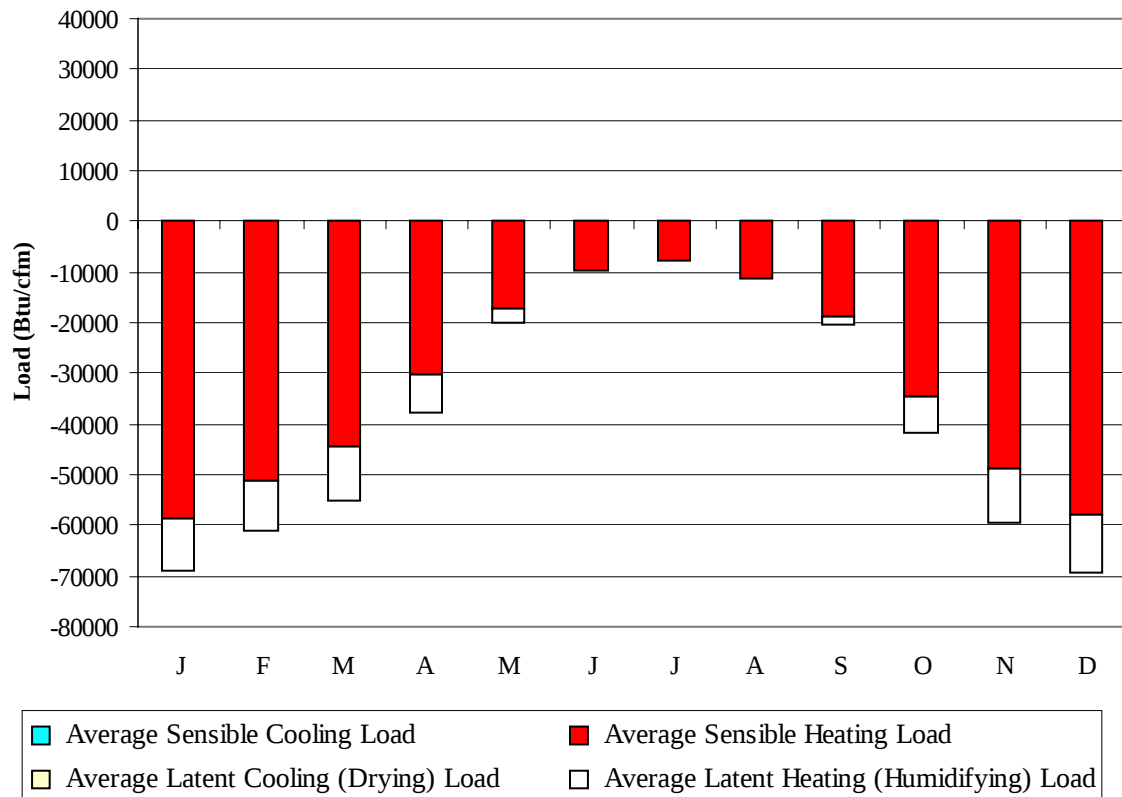
|     | Mean Cooling<br>Degree Days (°F) | Mean Heating<br>Degree Days (°F) |
|-----|----------------------------------|----------------------------------|
| JAN | 0                                | 2175                             |
| FEB | 0                                | 1884                             |
| MAR | 0                                | 1619                             |
| APR | 0                                | 1072                             |
| MAY | 5                                | 578                              |
| JUN | 25                               | 291                              |
| JUL | 42                               | 217                              |
| AUG | 14                               | 344                              |
| SEP | 1                                | 638                              |
| OCT | 0                                | 1247                             |
| NOV | 0                                | 1796                             |
| DEC | 0                                | 2144                             |
| ANN | 87                               | 14005                            |

MCGRATH

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WMO No. 702310

**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 Load | Average Latent Heating Load |
|-----|-------------------------------|-------------------------------|-----------------------------|-----------------------------|
|     | (Btu/cfm)                     | (Btu/cfm)                     | (Btu/cfm)                   | (Btu/cfm)                   |
| JAN | 0                             | -58788                        | 0                           | -10240                      |
| FEB | 0                             | -51042                        | 0                           | -10133                      |
| MAR | 0                             | -44365                        | 0                           | -10723                      |
| APR | 0                             | -30125                        | 0                           | -7527                       |
| MAY | 3                             | -17334                        | 0                           | -2766                       |
| JUN | 45                            | -9551                         | 1                           | -284                        |
| JUL | 110                           | -7571                         | 4                           | -3                          |
| AUG | 18                            | -11150                        | 8                           | -171                        |
| SEP | 0                             | -18844                        | 0                           | -1624                       |
| OCT | 0                             | -34726                        | 0                           | -7128                       |
| NOV | 0                             | -48882                        | 0                           | -10656                      |
| DEC | 0                             | -57974                        | 0                           | -11180                      |
| ANN | 176                           | -390352                       | 13                          | -72435                      |

## Average Annual Solar Radiation – Nearest Available Site

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

City: MCGRATH  
 State: AK  
 WBAN No: 26510  
 Lat(N): 62.97  
 Long(W): 155.62  
 Elev(ft): 338

Stn Type: Secondary  
 SHADING GEOMETRY IN DIMENSIONLESS UNITS  
 Window: 1  
 Overhang: 0.165  
 Vert Gap: 0.2

| 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  | 72  | 300  | 770  | 1320 | 1510 | 1610 | 1470 | 1090 | 700  | 340  | 120 | 32  | 780  |
|                                                                               | Std Dev | 6   | 28   | 70   | 101  | 138  | 140  | 133  | 117  | 96   | 30   | 11  | 4   | 37   |
|                                                                               | Minimum | 60  | 250  | 590  | 1090 | 1230 | 1360 | 1280 | 900  | 540  | 280  | 92  | 25  | 700  |
|                                                                               | Maximum | 82  | 360  | 900  | 1480 | 1810 | 1860 | 1710 | 1300 | 880  | 390  | 130 | 38  | 870  |
| Clear Day                                                                     | Diffuse | 48  | 170  | 390  | 690  | 760  | 850  | 820  | 630  | 400  | 230  | 84  | 23  | 430  |
|                                                                               | Global  | 82  | 340  | 900  | 1680 | 2260 | 2550 | 2380 | 1810 | 1090 | 480  | 130 | 38  | 1150 |
| NORTH                                                                         | Global  | 29  | 100  | 240  | 430  | 580  | 670  | 600  | 410  | 240  | 130  | 48  | 15  | 290  |
|                                                                               | Diffuse | 29  | 100  | 240  | 410  | 480  | 540  | 500  | 380  | 240  | 130  | 48  | 15  | 260  |
| Clear Day                                                                     | Global  | 29  | 82   | 190  | 390  | 720  | 980  | 840  | 470  | 220  | 110  | 38  | 13  | 340  |
|                                                                               | Global  | 80  | 280  | 630  | 970  | 1070 | 1080 | 970  | 740  | 510  | 270  | 110 | 38  | 560  |
| EAST                                                                          | Diffuse | 38  | 140  | 320  | 530  | 580  | 630  | 590  | 450  | 300  | 170  | 63  | 18  | 320  |
|                                                                               | Global  | 140 | 420  | 910  | 1440 | 1750 | 1870 | 1780 | 1480 | 1030 | 550  | 200 | 76  | 970  |
| SOUTH                                                                         | Global  | 380 | 840  | 1260 | 1340 | 1140 | 1060 | 1000 | 930  | 840  | 590  | 400 | 210 | 830  |
|                                                                               | Diffuse | 100 | 260  | 450  | 620  | 610  | 640  | 610  | 500  | 370  | 250  | 140 | 53  | 380  |
| Clear Day                                                                     | Global  | 770 | 1460 | 2000 | 2060 | 1830 | 1720 | 1730 | 1860 | 1910 | 1610 | 920 | 510 | 1530 |
|                                                                               | Global  | 82  | 290  | 640  | 960  | 1010 | 1030 | 950  | 760  | 520  | 270  | 110 | 39  | 560  |
| WEST                                                                          | Diffuse | 38  | 140  | 320  | 540  | 580  | 640  | 590  | 460  | 300  | 170  | 63  | 18  | 320  |
|                                                                               | Global  | 140 | 420  | 910  | 1440 | 1750 | 1870 | 1780 | 1480 | 1030 | 550  | 200 | 76  | 970  |

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

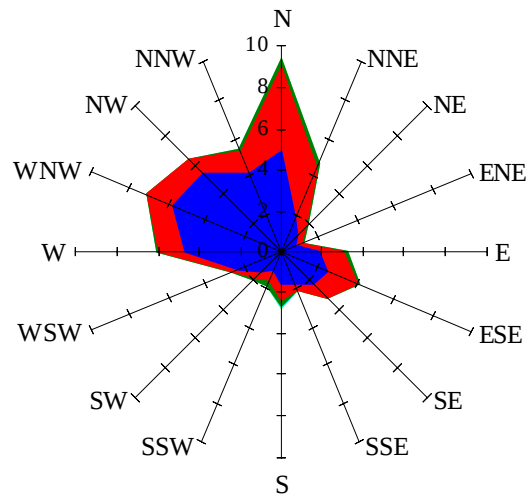
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

| 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 | 37  | 160 | 480 | 890 | 1050 | 1130 | 1030 | 760 | 460 | 210 | 65  | 17  | 530  |
| NORTH                                                                                               | Unshaded | 20  | 71  | 160 | 290 | 390  | 460  | 400  | 270 | 170 | 90  | 33  | 10  | 200  |
|                                                                                                     | Shaded   | 19  | 68  | 160 | 280 | 380  | 450  | 390  | 270 | 160 | 87  | 32  | 10  | 190  |
| EAST                                                                                                | Unshaded | 50  | 190 | 450 | 700 | 770  | 770  | 690  | 530 | 370 | 180 | 73  | 22  | 400  |
|                                                                                                     | Shaded   | 49  | 190 | 440 | 690 | 760  | 760  | 680  | 520 | 360 | 180 | 71  | 21  | 390  |
| SOUTH                                                                                               | Unshaded | 290 | 640 | 930 | 950 | 790  | 730  | 690  | 650 | 610 | 450 | 310 | 170 | 600  |
|                                                                                                     | Shaded   | 290 | 640 | 920 | 940 | 780  | 700  | 670  | 640 | 600 | 440 | 300 | 170 | 590  |
| WEST                                                                                                | Unshaded | 51  | 200 | 460 | 690 | 730  | 740  | 680  | 540 | 370 | 190 | 72  | 22  | 400  |
|                                                                                                     | Shaded   | 50  | 200 | 450 | 680 | 710  | 720  | 670  | 530 | 370 | 180 | 71  | 22  | 390  |

| 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  | 6     | 27   | 43  | 43  | 28  | 31   | 54   | 71  | 76  | 68  |
|                                                                                                                  | M.Cloudy | 5     | 20   | 32  | 31  | 21  | 19   | 34   | 46  | 52  | 47  |
| NORTH                                                                                                            | M.Clear  | 3     | 8    | 10  | 10  | 8   | 18   | 12   | 14  | 14  | 14  |
|                                                                                                                  | M.Cloudy | 2     | 8    | 12  | 12  | 8   | 11   | 12   | 15  | 16  | 15  |
| EAST                                                                                                             | M.Clear  | 26    | 58   | 33  | 10  | 8   | 70   | 78   | 54  | 14  | 14  |
|                                                                                                                  | M.Cloudy | 8     | 26   | 21  | 12  | 8   | 27   | 37   | 33  | 16  | 15  |
| SOUTH                                                                                                            | M.Clear  | 8     | 53   | 87  | 87  | 55  | 8    | 33   | 64  | 75  | 60  |
|                                                                                                                  | M.Cloudy | 4     | 24   | 42  | 41  | 24  | 8    | 20   | 37  | 45  | 37  |
| WEST                                                                                                             | M.Clear  | 3     | 8    | 10  | 32  | 59  | 8    | 12   | 14  | 17  | 57  |
|                                                                                                                  | M.Cloudy | 2     | 8    | 12  | 20  | 25  | 8    | 12   | 15  | 17  | 36  |
| M.Clear                                                                                                          | (% hrs)  | 35    | 36   | 36  | 37  | 37  | 21   | 20   | 16  | 11  | 8   |
|                                                                                                                  |          | Sept  |      |     |     |     | Dec  |      |     |     |     |
|                                                                                                                  |          | 9am   | 11am | 1pm | 3pm | 5pm | 9am  | 11am | 1pm | 3pm | 5pm |
| HORIZ.                                                                                                           | M.Clear  | 4     | 25   | 44  | 49  | 40  | 0    | 0    | 4   | 3   | 0   |
|                                                                                                                  | M.Cloudy | 3     | 14   | 24  | 29  | 24  | 0    | 0    | 3   | 3   | 0   |
| NORTH                                                                                                            | M.Clear  | 2     | 7    | 10  | 11  | 10  | 0    | 0    | 2   | 2   | 0   |
|                                                                                                                  | M.Cloudy | 1     | 6    | 9   | 11  | 9   | 0    | 0    | 2   | 1   | 0   |
| EAST                                                                                                             | M.Clear  | 20    | 61   | 47  | 11  | 10  | 0    | 0    | 6   | 2   | 0   |
|                                                                                                                  | M.Cloudy | 4     | 18   | 19  | 11  | 9   | 0    | 0    | 3   | 1   | 0   |
| SOUTH                                                                                                            | M.Clear  | 2     | 37   | 73  | 85  | 66  | 0    | 0    | 23  | 20  | 0   |
|                                                                                                                  | M.Cloudy | 1     | 12   | 25  | 34  | 26  | 0    | 0    | 6   | 4   | 0   |
| WEST                                                                                                             | M.Clear  | 2     | 7    | 10  | 15  | 52  | 0    | 0    | 2   | 7   | 0   |
|                                                                                                                  | M.Cloudy | 1     | 6    | 9   | 12  | 22  | 0    | 0    | 2   | 2   | 0   |
| M.Clear                                                                                                          | (% hrs)  | 19    | 19   | 19  | 17  | 17  | 38   | 31   | 29  | 31  | 33  |

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

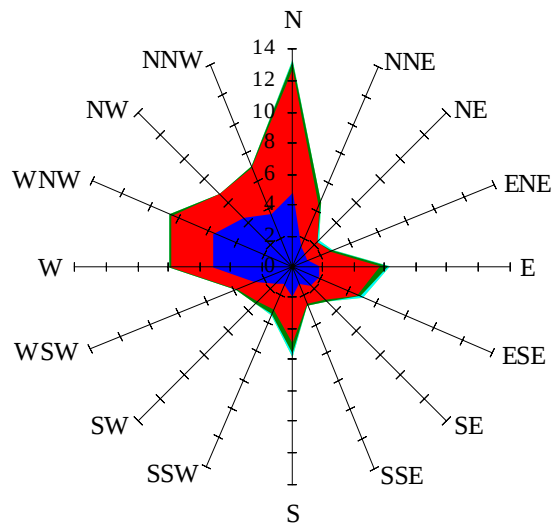
Labels of Percent Frequency on North Axis



Percent Calm = 36.51

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

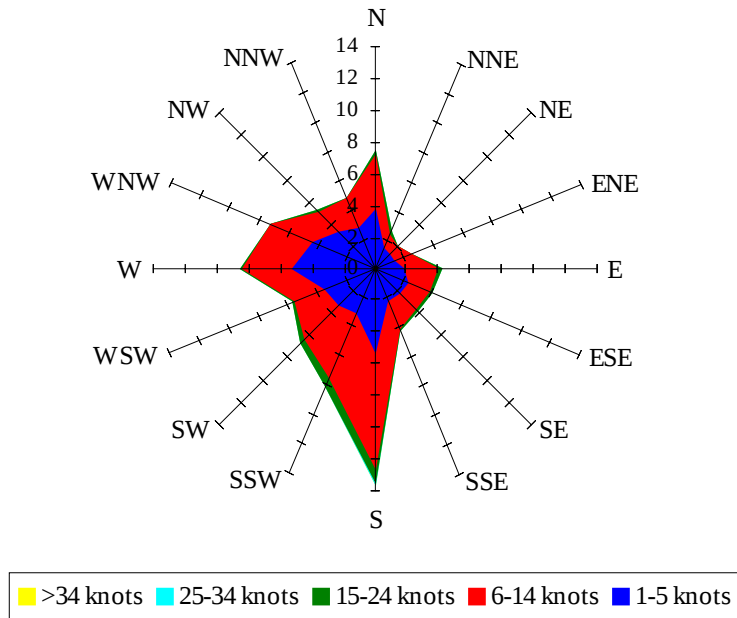
Labels of Percent Frequency on North Axis



Percent Calm = 15.05

### Wind Summary - June, July, and August

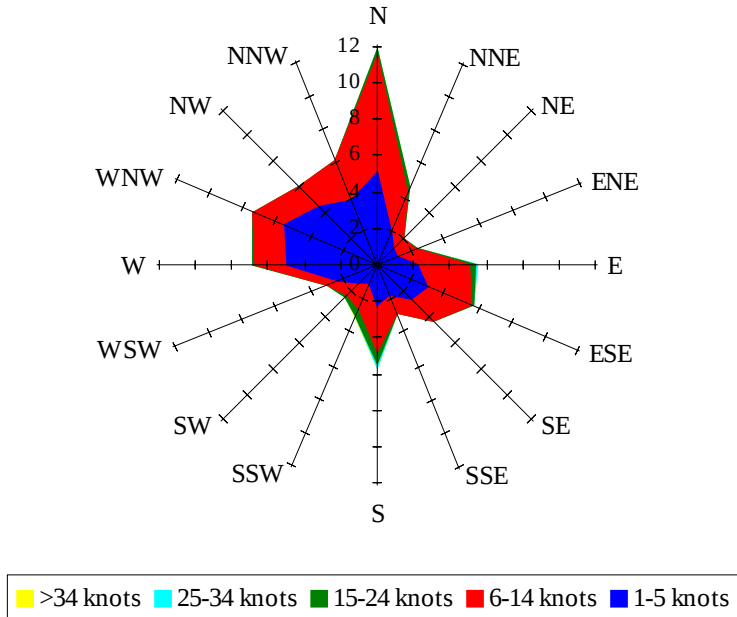
Labels of Percent Frequency on North Axis



Percent Calm = 11.15

### Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 20.83