

Weather and Crop Summary, 2001

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The Klamath Basin of southern Klamath County, Oregon and northern Modoc and Siskiyou counties, California enjoys a semi-arid climate with average annual precipitation of about 13 in at Klamath Falls. The valley floor, at 4,100 ft elevation, is susceptible to frost any day of the year and typically experiences a frost-free season of less than 100 days. In 3 of the last 10 years, at least one frost has been recorded in each month at the Klamath Experiment Station (KES). South of Klamath Falls, the Lower Klamath Lake and Copic Bay areas experience minimum temperatures 5 to 7°F cooler than temperatures recorded at KES.

Economical agricultural enterprises in the region depend on supplemental irrigation for crop production other than rangeland, pastures, and meadow hay. In the late 1800's, conversion of the region to agricultural use commenced with the development of privately owned irrigation projects. In 1905, the U.S. Bureau of Reclamation purchased most of the private irrigation companies and initiated the construction of the Klamath Irrigation Project (KIP) to service about 240,000 acres in the upper basin. By about 1960, the project was fully developed. In recent years, the KIP has provided irrigation water to about 190,000 to 200,000 acres of cropland annually. Although drought conditions have resulted in less than full water deliveries a few times, major shortages

were not experienced in the 95 years of operation through 2000.

Changing allocations of surface water supplies to meet perceived needs of endangered sucker species in Upper Klamath Lake and threatened coho salmon in the Klamath River, combined with drought conditions in the upper watershed, resulted in severe curtailment of irrigation deliveries to KIP properties in 2001. Initially, the KIP 2001 operations plan allocated normal deliveries to about 26,000 acres in the Langell Valley and Horsefly irrigation districts served by Gerber and Clear Lake reservoirs. In late July, about 70,000 acre-ft were diverted to project lands from Klamath Lake and Klamath River. Existing and newly developed wells supplied additional water to small acreages scattered throughout the project. The Klamath County tax assessor estimated that 85,000 acres within project boundaries in Klamath County received less than full irrigation in 2001. This resulted in a major disruption of agricultural activities on about 150,000 acres of KIP cropland, including the KES headquarters.

The U.S. Weather Bureau monitored precipitation at Klamath Falls from 1884 through 1948 (Table 1). National Oceanic and Atmospheric Administration (NOAA) established a station at Kingsley Field in 1949. The Kingsley Field site is located at 42°44' N latitude, 121°44' W longitude, and at an elevation of 4,092 ft. NOAA closed the Kingsley Field station in 1996. The

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KES weather station, located one-fourth mile west of Kingsley Field, has been in operation since 1984 and was designated as the official NOAA Klamath Falls station in 1997.

The U.S. Bureau of Reclamation (BOR) office in Boise, Idaho has established four additional weather stations in the region in the past 3 years as part of a regional Agricultural Meteorological (AgriMet) network. Instrumentation was installed adjacent to the KES NOAA station in April 1999. Stations were established in April 2000 in the Lower Klamath Lake (LKL) area about 15 miles southwest of Klamath Falls and at the northwest shore of Agency Lake at the pumping station for drainage of Agency Lake Ranch (ALR), about 25 miles northwest of Klamath Falls. A fourth AgriMet station was installed in the Langell Valley (LV) near the town of Lorella in April 2001.

The cyclical nature of precipitation patterns in the region can be seen by comparing total annual precipitation at KES from 1991 through 2001 (Table 1). For the first 4 years of this period, average precipitation was 10.82 in. In 1995-1998 the average precipitation was 18.10 in, the highest 4-year average since records began. This period was followed by 3 years of below normal precipitation with an average of 11.03 in. The lowest 4-year period on record was from 1929 to 1932. Each year received less than 10.00 in and the 4-year average was 9.34 in during this period.

While total 2001 Klamath Falls precipitation was about 75 percent of long-term averages, this is misleading. Above normal precipitation in November and December accounted for 54 percent of the yearly total, more than twice the typical contribution for these

months (Table 2). For the October 1, 2000 to September 30, 2001 water year, total precipitation recorded at KES was 6.69 in. This is less than the total annual calendar-year precipitation for all years of record except 1949.

Mean annual air temperatures in 2001 were only slightly different than long-term averages (Table 2). A comparison of maximum and minimum means for June through September suggests the diurnal fluctuations were greater due to lower relative humidity related to lack of irrigation in the area. This is also evident in the air and soil temperature data for the growing season of April through October from 1970 to 2001 (Table 3). The 39°F diurnal spread in 2001 is greater than in any other year in the data set, in which the average spread is 31°F. Weekly temperature summaries for April through October show similar trends (Table 4).

The 2001 frost-free season extended 78 days from June 19 through September 5, based on the NOAA KES station. Minimum air temperatures of 33°F were recorded at KES on July 17 and July 31. Frosts were experienced at the LKL AgriMet station on both of these dates. Frequency of frosts at KES was greater in 2001 than the average for the previous 21 years (Table 5). Maximum temperatures at KES reached or exceeded 90°F on 31 days in 2001 with highs of 97°F reached on July 5 and August 9. Precipitation during April through September was the lowest since 1981 (Table 2). Only 0.47 in was recorded from mid-May through early September (Table 5).

The AgriMet network is intended to provide daily crop-specific water-use estimates to assist in irrigation scheduling. These stations monitor soil temperature at 4- and 8-in depths, solar

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radiation, air temperature, wind speed and direction, and precipitation. Readings taken at 15-minute intervals are stored and transmitted every 4 hours through a geostationary satellite to the BOR coordinating office in Boise, Idaho. Crop water use data are displayed on Internet web pages at the Klamath County Cooperative Extension Service and the KES homepage, or can be obtained from the BOR's regional Hydromet System at <http://www.pn.usbr.gov/agrimet>.

Observations for the AgriMet stations are based on midnight to midnight reporting. NOAA readings are based on 7:30 a.m. observations. This leads to minor differences in daily observations between the two stations. Mean monthly comparisons of 2001 air temperatures, precipitation, and wind speed for KES, NOAA, and AgriMet stations are presented in Table 6. Minimum air temperatures averaged 3°F lower in 2001 and 4°F lower in 2000 based on NOAA observations. This is probably due to NOAA sensors being located closer to ground level and the time of observation, which can result in minimum temperature at time of observation being applied to the previous and current day for NOAA readings. Annual total precipitation was 3 percent higher for the NOAA station in 2001. In 2000, the NOAA station reported 8 percent greater precipitation. Differences in mean monthly wind speeds were small.

Crop water-use estimates can be based on evapotranspiration (ET) estimates or standard pan evaporation data adjusted for crop canopy stage. The ET values reported in Table 6 are for actively growing alfalfa. Values for row crops and cereals would be considerably lower. For example, seasonal water use

for potatoes in the region is about 20 in compared with 30-32 in for alfalfa. Pan evaporation data are collected for the NOAA station from May 1 through September 30. In 1999 and 2000, total pan evaporation for this period measured 38.9 and 38.5 in, respectively. In 2000, the AgriMet ET estimate was 92 percent of pan evaporation. The 2001 ET was only 84 percent of pan evaporation (Table 6). Higher evaporation readings in 2001 were undoubtedly related to low relative humidity resulting from lack of irrigation in the area near the weather station. It was also speculated that birds or mammals were drinking from the evaporation pan in 2001. On several days, pan readings exceeded 0.5 in. In previous years, readings seldom exceeded 0.4 in.

The AgriMet network in the Klamath Basin provides an opportunity to compare temperatures and precipitation in several locations within the region. Mean monthly air temperatures and total monthly precipitation are shown for the four AgriMet stations in Table 7. The LV station was installed at the end of March and does not provide total annual data for 2001.

Microclimate effects on air temperatures are evident in the AgriMet data. The LKL station is situated in a low elevation area that typically experiences summer frosts more frequently than the KES site. From May through October, minimum air temperatures were 5°F lower at LKL than at KES. The ALR station is located immediately adjacent to Agency Lake. Air temperatures are moderated with lower maximums for each month except December compared to KES (Table 7). Minimum temperatures are slightly warmer near the lake during spring

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months. The LV site experienced similar maximum temperatures to the KES site and was intermediate between KES and LKL sites in minimum temperatures during summer months. Trends in air temperatures at KES, LKL, and ALR sites were similar in 2000.

Total annual precipitation for 2001 recorded at ALR was 28 and 54 percent greater than at KES and LKL, respectively. This was the first full year of data at the sites. In 2000, total precipitation from May through December was 3.33, 3.93, and 3.96 in at KES, LKL, and ALR, respectively. Precipitation at LV was slightly greater than at KES and LKL from April through December.

Daily weather records from the NOAA KES station are available for the past 3 years on the KES Internet Home Page at: <http://www.orst.edu/dept/kes>. Current weather records are updated daily on weekdays.

For Klamath Basin areas that received irrigation water, the 2001 weather conditions were favorable for crop production. Yields and quality of potato crops were generally good. The only disease problem of significance was pink rot (*Phytophthora erythroseptica*). Damage from this disease was observed in fresh market russet varieties and in round white chipping varieties at several locations, including KES research plots.

Performance of forage crops ranged from total loss of harvestable crops to normal production. A 6-year-old alfalfa trial at KES produced about 1 ton/acre in an unirrigated first cutting. In previous years, first cuttings in this field averaged about 2.5 tons/acre. Following about 5 in of irrigation applied in early August, a second cutting in September produced about 1 ton/acre. Total production from the two cuttings was

about 2 tons/acre compared to a 4-year average of 6.5 tons/acre for 1997-2000. Crops on soils with higher moisture holding capacity produced significantly greater yields under dryland conditions.

A 12-acre field of annual ryegrass established in grain stubble with a no-till drill at KES in the fall of 2000 failed to produce a harvestable crop after severe waterfowl grazing in early spring. A small annual ryegrass field at KES planted with conventional tillage and a grain drill in August of 2000, but not subjected to waterfowl grazing, produced a single cutting of about 0.5 ton/acre. Neither field was irrigated in 2001. Pasture production in dryland situations was very limited. A KES pasture in the LKL area that received winter flooding but no summer irrigation supported about 25 percent of the normal stocking rate. Severe overgrazing on some pastures may require renovation to restore productivity.

Dryland cereal crops also experienced wide fluctuations in productivity. Performance of species and varieties in cover crop trials established at KES will be discussed later in this report. Commercial production on high organic matter soils used for potato or onion production in 2000 is reported to have produced barley yields of up to 3 tons/acre with acceptable quality. These fields benefited from residual fertilizer and moisture from the previous crop. Some fields failed to produce harvestable crops. Time of planting, previous crop, soil type, frosts, and locally variable rainfall during the growing season all contributed to the relative performance between fields.

The most serious effect of water supply curtailment on future crops may be the severe weed infestations and

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resulting seed production that occurred in 2001. While weed control was achieved on some fields, many fields were allowed to produce unchecked weed populations. Weeds also proliferated in irrigation and drain ditches. Seeds produced in these fields and ditches will increase weed control costs for years.

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Table 1. Annual precipitation at Klamath Falls, OR, recorded by the U.S. Weather Bureau (1884-1948), National Weather Service (NOAA) (1949-2001), and Klamath Experiment Station (KES) (1984-2001).

| Precipitation | | | | | | | | |
|---------------------|-----------------|-------|-------|------|-------|------|-------|-------|
| Year | in | Year | in | Year | in | Year | in | |
| U.S. Weather Bureau | | | | NOAA | | | KES | |
| 1884 | 17.94 | 1921 | 11.94 | 1949 | 6.86 | 1979 | 14.10 | |
| 1885 | 18.71 | 1922 | 15.19 | 1950 | 13.56 | 1980 | 11.03 | |
| 1886 | 18.06 | 1923 | 9.85 | 1951 | 10.76 | 1981 | 15.57 | |
| 1887 | 10.71 | 1924 | 11.28 | 1952 | 10.97 | 1982 | 13.90 | |
| 1888 | 13.75 | 1925 | 14.26 | 1953 | 10.76 | 1983 | 18.56 | |
| 1889 | 10.40 | 1926 | 13.23 | 1954 | 8.57 | 1984 | 12.98 | 13.32 |
| 1890 | IN ¹ | 1927 | 15.47 | 1955 | 11.31 | 1985 | 9.17 | 10.15 |
| 1891-99 | NA ² | 1928 | 11.65 | 1956 | 12.52 | 1986 | 13.49 | 13.06 |
| 1900 | NA | 1929 | 8.56 | 1957 | 18.38 | 1987 | 10.11 | 10.13 |
| | | 1930 | 9.44 | 1958 | 13.25 | 1988 | 10.32 | 10.15 |
| | | | | 1959 | 6.72 | 1989 | 12.11 | 12.08 |
| | | | | 1960 | 15.86 | 1990 | 13.33 | 12.46 |
| 1901 | NA | 1931 | 9.50 | 1961 | 13.21 | 1991 | 10.50 | 9.29 |
| 1902 | 11.26 | 1932 | 9.84 | 1962 | 16.92 | 1992 | 11.68 | 11.34 |
| 1903 | IN | 1933 | 11.01 | 1963 | 10.41 | 1993 | 16.78 | 14.96 |
| 1904 | 15.04 | 1934 | 10.47 | 1964 | 15.45 | 1994 | 9.84 | 7.72 |
| 1905 | 8.32 | 1935 | 11.25 | 1965 | 10.12 | 1995 | 22.66 | 19.06 |
| 1906 | 14.87 | 1936 | 13.44 | 1966 | 11.50 | 1996 | 23.91 | 19.54 |
| 1907 | 16.67 | 1937 | 19.41 | 1967 | 9.21 | 1997 | 14.29 | 14.29 |
| 1908 | 10.02 | 1938 | 13.05 | 1968 | 10.18 | 1998 | 19.51 | 19.51 |
| 1909 | 17.67 | 1939 | 11.99 | 1969 | 15.38 | 1999 | 11.54 | 11.54 |
| 1910 | 14.70 | 1940 | 17.12 | 1970 | 12.61 | 2000 | 11.51 | 11.51 |
| 1911 | 9.73 | 1941 | 19.71 | 1971 | 12.68 | 2001 | 10.03 | 10.03 |
| 1912 | 19.56 | 1942 | 14.09 | 1972 | 11.72 | | | |
| 1913 | 16.11 | 1943 | 13.82 | 1973 | 11.03 | | | |
| 1914 | 11.42 | 1944 | 12.42 | 1974 | 8.64 | | | |
| 1915 | 11.72 | 1945 | 16.52 | 1975 | 13.21 | | | |
| 1916 | 10.98 | 1946 | 11.46 | 1976 | 8.70 | | | |
| 1917 | 10.22 | 1947 | 11.32 | 1977 | 12.37 | | | |
| 1918 | 9.51 | 1948 | 20.91 | 1978 | 9.30 | | | |
| 1919 | 9.40 | | | | | | | |
| 1920 | 12.22 | | | | | | | |
| Means | 1884-1948 | 13.22 | | | | | | |
| | 1949-1983 | 12.51 | | | | | | |
| NOAA | 1984-1997 | 13.65 | | | | | | |
| KES | 1984-2001 | 12.79 | | | | | | |

¹IN: datum incomplete.

²NA: datum unavailable.

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Table 2. Mean monthly air temperatures and total monthly precipitation recorded at the Klamath Experiment Station, Klamath Falls, OR, for 2001 and for 1984 to 2000.

| Month | Mean monthly temperature | | | Total precipitation |
|------------|--------------------------|-----|------|---------------------|
| | max | min | mean | |
| | °F | | | in |
| | <u>2001</u> | | | |
| January | 42 | 17 | 30 | 0.20 |
| February | 43 | 20 | 31 | 0.48 |
| March | 55 | 25 | 40 | 0.78 |
| April | 54 | 25 | 40 | 0.94 |
| May | 75 | 36 | 55 | 0.61 |
| June | 75 | 37 | 56 | 0.23 |
| July | 84 | 43 | 64 | 0.22 |
| August | 87 | 45 | 66 | 0.05 |
| September | 79 | 36 | 57 | 0.73 |
| October | 68 | 27 | 48 | 0.33 |
| November | 49 | 24 | 36 | 2.88 |
| December | 37 | 21 | 29 | 2.58 |
| Mean/Total | 62 | 30 | 46 | 10.03 |
| | <u>1984-2000</u> | | | |
| January | 40 | 20 | 30 | 1.99 |
| February | 44 | 23 | 34 | 1.19 |
| March | 52 | 27 | 39 | 1.24 |
| April | 59 | 30 | 45 | 0.94 |
| May | 66 | 36 | 51 | 1.21 |
| June | 74 | 43 | 59 | 0.79 |
| July | 83 | 48 | 65 | 0.40 |
| August | 83 | 46 | 64 | 0.53 |
| September | 76 | 39 | 58 | 0.72 |
| October | 65 | 30 | 48 | 0.76 |
| November | 47 | 24 | 36 | 1.63 |
| December | 39 | 18 | 29 | 1.55 |
| Mean/Total | 61 | 32 | 47 | 12.95 |

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Table 3. Mean air temperatures for April through September, mean 4-in soil temperatures for May through October, and total precipitation for April through September and annually from 1970 to 2001 at Klamath Falls, OR.

| Year | Air temperature | | | 4-in soil temperature | | | Total precipitation | |
|------|-----------------|-----|------|-----------------------|-----|------|---------------------|--------|
| | Apr-Sept | | | May-Oct | | | Apr-Sept | annual |
| | max | min | mean | max | min | mean | | |
| | °F | | | | | | in | |
| 2001 | 76 | 37 | 56 | 74 | 59 | 66 | 2.78 | 10.03 |
| 2000 | 72 | 39 | 56 | 70 | 56 | 63 | 4.20 | 11.51 |
| 1999 | 72 | 39 | 55 | 68 | 55 | 61 | 3.98 | 11.54 |
| 1998 | 73 | 41 | 57 | 59 | 57 | 58 | 6.95 | 19.51 |
| 1997 | 73 | 41 | 57 | 60 | 57 | 58 | 4.52 | 14.29 |
| 1996 | 72 | 39 | 56 | 61 | 59 | 60 | 5.50 | 19.54 |
| 1995 | 72 | 40 | 56 | 61 | 57 | 59 | 7.10 | 19.06 |
| 1994 | 76 | 40 | 58 | 63 | 59 | 61 | 3.42 | 7.72 |
| 1993 | 70 | 38 | 54 | 60 | 55 | 58 | 5.82 | 14.96 |
| 1992 | 77 | 42 | 60 | 66 | 58 | 62 | 3.41 | 11.34 |
| 1991 | 73 | 40 | 57 | 61 | 55 | 59 | 3.41 | 9.29 |
| 1990 | 74 | 41 | 58 | 61 | 55 | 58 | 5.66 | 12.46 |
| 1989 | 72 | 40 | 56 | 62 | 55 | 59 | 5.16 | 12.08 |
| 1988 | 75 | 41 | 58 | 64 | 56 | 60 | 3.13 | 10.15 |
| 1987 | 76 | 41 | 59 | 65 | 56 | 61 | 3.24 | 10.13 |
| 1986 | 73 | 42 | 58 | 70 | 59 | 64 | 3.87 | 13.06 |
| 1985 | 74 | 40 | 57 | 64 | 53 | 59 | 5.50 | 10.13 |
| 1984 | 71 | 41 | 56 | 70 | 57 | 64 | 4.36 | 13.32 |
| 1983 | 69 | 40 | 55 | 73 | 59 | 66 | 3.88 | 18.56 |
| 1982 | 70 | 40 | 55 | 71 | 57 | 64 | 4.18 | 13.90 |
| 1981 | 74 | 42 | 58 | 73 | 58 | 66 | 2.43 | 15.57 |
| 1980 | 71 | 41 | 56 | 74 | 59 | 67 | 2.75 | 11.03 |
| 1979 | 74 | 42 | 58 | | | | 3.77 | 14.10 |
| 1978 | 70 | 40 | 55 | 71 | 58 | 65 | 4.57 | 9.30 |
| 1977 | 73 | 43 | 58 | 71 | 58 | 65 | 4.97 | 12.37 |
| 1976 | 69 | 41 | 55 | 72 | 57 | 65 | 4.94 | 8.70 |
| 1975 | 71 | 41 | 56 | | | | 4.10 | 13.21 |
| 1974 | 74 | 42 | 58 | 70 | 56 | 63 | 1.82 | 8.64 |
| 1973 | 75 | 42 | 59 | 69 | 55 | 62 | 1.29 | 11.03 |
| 1972 | 73 | 41 | 57 | | | | 1.87 | 11.72 |
| 1971 | 70 | 40 | 55 | | | | 4.68 | 12.68 |
| 1970 | 74 | 39 | 57 | 70 | 57 | 64 | 1.25 | 12.61 |
| Mean | 73 | 41 | 57 | 67 | 57 | 62 | 4.02 | 12.61 |

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Table 4. Weekly average maximum, minimum, and mean air temperatures for the 2001 growing season and 1979 to 2000 at Klamath Falls, OR.

| Weekly period | 2001 | | | 1979-2000 | | | |
|---------------|----------------|-----|------|----------------|-----|------|----|
| | Weekly average | | | Weekly average | | | |
| | max | min | mean | max | min | mean | |
| | °F | | | | | | |
| April | 1-7 | 51 | 20 | 35 | 55 | 29 | 42 |
| | 8-14 | 44 | 20 | 32 | 57 | 30 | 43 |
| | 15-21 | 54 | 29 | 42 | 59 | 33 | 46 |
| | 22-28 | 68 | 34 | 51 | 59 | 32 | 46 |
| | 29-5 | 63 | 26 | 44 | 62 | 34 | 48 |
| May | 6-12 | 78 | 32 | 55 | 63 | 35 | 49 |
| | 13-19 | 69 | 37 | 53 | 66 | 36 | 51 |
| | 20-26 | 84 | 44 | 64 | 69 | 39 | 54 |
| | 27-2 | 78 | 38 | 58 | 69 | 40 | 55 |
| June | 3-9 | 70 | 33 | 52 | 70 | 41 | 56 |
| | 10-16 | 74 | 34 | 54 | 73 | 43 | 58 |
| | 17-23 | 85 | 40 | 62 | 76 | 44 | 60 |
| | 24-30 | 74 | 41 | 58 | 78 | 46 | 62 |
| July | 1-7 | 91 | 47 | 69 | 78 | 46 | 62 |
| | 8-14 | 86 | 45 | 66 | 82 | 48 | 65 |
| | 15-21 | 78 | 41 | 59 | 83 | 49 | 66 |
| | 22-28 | 87 | 43 | 65 | 85 | 50 | 68 |
| | 29-4 | 81 | 42 | 62 | 86 | 49 | 67 |
| August | 5-11 | 92 | 50 | 71 | 86 | 49 | 67 |
| | 12-18 | 91 | 46 | 68 | 83 | 47 | 65 |
| | 19-25 | 80 | 42 | 61 | 81 | 45 | 63 |
| | 26-1 | 90 | 44 | 67 | 80 | 43 | 62 |
| September | 2-8 | 81 | 37 | 59 | 80 | 43 | 61 |
| | 9-15 | 80 | 40 | 60 | 77 | 40 | 59 |
| | 16-22 | 81 | 36 | 59 | 74 | 39 | 56 |
| | 23-29 | 66 | 35 | 50 | 73 | 38 | 55 |
| | 30-6 | 81 | 33 | 57 | 73 | 35 | 54 |
| October | 7-13 | 66 | 23 | 45 | 68 | 34 | 51 |
| | 14-20 | 70 | 27 | 48 | 64 | 29 | 46 |
| | 21-27 | 64 | 22 | 43 | 61 | 30 | 46 |
| Mean | 75 | 36 | 56 | 72 | 40 | 56 | |

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Table 5. Weekly minimum air temperatures, frost days, and precipitation for the 2001 growing season and 1979 to 2000 at Klamath Falls, OR.

| Weekly period | Weekly min. | | Frost days/week | | Weekly precip. | | Accum. precip. | | |
|---------------|-------------|---------|-----------------|---------|----------------|---------|----------------|---------|------|
| | 2001 | 1979-00 | 2001 | 1979-00 | 2001 | 1979-00 | 2001 | 1979-00 | |
| | °F | | % | | in | | | | |
| April | 1-7 | 14 | 11 | 100 | 75 | 0.20 | 0.15 | 0.20 | 0.15 |
| | 8-14 | 15 | 15 | 100 | 66 | 0.19 | 0.17 | 0.39 | 0.32 |
| | 15-21 | 20 | 17 | 86 | 50 | 0.55 | 0.27 | 0.94 | 0.59 |
| | 22-28 | 27 | 20 | 43 | 52 | 0.00 | 0.24 | 0.94 | 0.83 |
| | 29-5 | 21 | 19 | 86 | 36 | 0.00 | 0.27 | 0.94 | 1.10 |
| May | 6-12 | 24 | 18 | 57 | 44 | 0.00 | 0.21 | 0.94 | 1.31 |
| | 13-19 | 29 | 19 | 28 | 33 | 0.61 | 0.27 | 1.55 | 1.58 |
| | 20-26 | 40 | 24 | 0 | 18 | 0.00 | 0.23 | 1.55 | 1.81 |
| | 27-2 | 30 | 27 | 28 | 18 | 0.00 | 0.31 | 1.55 | 2.12 |
| June | 3-9 | 22 | 26 | 43 | 10 | 0.03 | 0.26 | 1.58 | 2.38 |
| | 10-16 | 25 | 27 | 28 | 7 | 0.00 | 0.16 | 1.58 | 2.54 |
| | 17-23 | 32 | 30 | 28 | 4 | 0.00 | 0.07 | 1.58 | 2.61 |
| | 24-30 | 36 | 31 | 0 | 0 | 0.20 | 0.13 | 1.78 | 2.74 |
| July | 1-7 | 39 | 31 | 0 | 2 | 0.00 | 0.08 | 1.78 | 2.82 |
| | 8-14 | 40 | 34 | 0 | 0 | 0.17 | 0.04 | 1.95 | 2.86 |
| | 15-21 | 33 | 32 | 0 | 1 | 0.02 | 0.12 | 1.97 | 2.98 |
| | 22-28 | 37 | 35 | 0 | 0 | 0.00 | 0.03 | 1.97 | 3.01 |
| | 29-4 | 33 | 36 | 0 | 0 | 0.03 | 0.08 | 2.00 | 3.09 |
| August | 5-11 | 41 | 34 | 0 | 0 | 0.05 | 0.13 | 2.05 | 3.22 |
| | 12-18 | 43 | 29 | 0 | 2 | 0.00 | 0.10 | 2.05 | 3.32 |
| | 19-25 | 37 | 30 | 0 | 3 | 0.00 | 0.16 | 2.05 | 3.48 |
| | 26-1 | 41 | 29 | 0 | 2 | 0.00 | 0.18 | 2.05 | 3.66 |
| September | 2-8 | 27 | 29 | 28 | 4 | 0.00 | 0.09 | 2.05 | 3.75 |
| | 9-15 | 32 | 24 | 14 | 11 | 0.60 | 0.14 | 2.65 | 3.89 |
| | 16-22 | 33 | 24 | 0 | 12 | 0.00 | 0.19 | 2.65 | 4.08 |
| | 23-29 | 29 | 24 | 28 | 23 | 0.13 | 0.13 | 2.78 | 4.21 |
| | 30-6 | 31 | 20 | 57 | 25 | 0.00 | 0.06 | 2.78 | 4.27 |
| October | 7-13 | 17 | 18 | 100 | 40 | 0.09 | 0.17 | 2.87 | 4.44 |
| | 14-20 | 20 | 18 | 86 | 71 | 0.00 | 0.12 | 2.87 | 4.56 |
| | 21-27 | 12 | 15 | 86 | 67 | 0.02 | 0.32 | 2.89 | 4.88 |

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Table 6. A comparison of monthly mean air temperatures and wind miles, total precipitation, and pan evaporation (EVAP) versus evapotranspiration (ET) for NOAA and AgriMet (AGM) weather stations at Klamath Experiment Station, OR, 2001.

| Month | Air temperature | | | | | | Precipitation | | Wind | | EVAP | ET |
|--------------------|-----------------|-----|---------|-----|------|-----|---------------|------|-----------|-----|-------|-------|
| | Maximum | | Minimum | | Mean | | NOAA | AGM | NOAA | AGM | NOAA | AGM |
| | NOAA | AGM | NOAA | AGM | NOAA | AGM | | | | | | |
| | °F | | | | | | in | | miles/day | | in | |
| January | 42 | 42 | 17 | 21 | 30 | 31 | 0.20 | 0.27 | 71 | 73 | --- | 0.84 |
| February | 43 | 42 | 20 | 24 | 31 | 33 | 0.48 | 0.51 | 112 | 107 | --- | 1.31 |
| March | 55 | 54 | 25 | 28 | 40 | 41 | 0.78 | 0.91 | 103 | 102 | --- | 2.84 |
| April | 54 | 53 | 25 | 28 | 40 | 41 | 0.94 | 1.03 | 115 | 113 | --- | 3.93 |
| May | 75 | 74 | 36 | 39 | 55 | 58 | 0.61 | 0.65 | 112 | 108 | 9.00 | 8.10 |
| June | 75 | 73 | 37 | 40 | 56 | 58 | 0.23 | 0.22 | 123 | 119 | 10.27 | 8.79 |
| July | 84 | 82 | 43 | 47 | 64 | 65 | 0.22 | 0.19 | 104 | 100 | 11.45 | 9.65 |
| August | 87 | 86 | 45 | 48 | 66 | 68 | 0.05 | 0.05 | 88 | 87 | 10.69 | 8.72 |
| September | 79 | 78 | 36 | 40 | 57 | 59 | 0.73 | 0.62 | 70 | 70 | 7.13 | 5.36 |
| October | 68 | 66 | 27 | 32 | 48 | 49 | 0.33 | 0.31 | 75 | 77 | --- | 3.27 |
| November | 49 | 48 | 24 | 26 | 36 | 37 | 2.88 | 2.49 | 90 | 95 | --- | 1.19 |
| December | 37 | 36 | 21 | 23 | 29 | 29 | 2.58 | 2.46 | 99 | 96 | --- | 0.50 |
| Mean | 62 | 61 | 30 | 33 | 46 | 47 | | | 97 | 96 | | |
| Total ¹ | | | | | | | 10.03 | 9.71 | | | 48.54 | 40.62 |

¹ Total from May 1 through September 30 for the AGM ET.

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Table 7. A comparison of monthly mean air temperatures and total monthly precipitation at the AgriMet weather stations located at the Klamath Experiment Station (KES), Lower Klamath Lake (LKL), Agency Lake Ranch (ALR), and Langell Valley (LV), OR, 2001.

| Month | Air temperature | | | | | | | | | | | | Precipitation | | | |
|-----------|-----------------|-----|-----|-----------------|---------|-----|-----|-----------------|------|-----|-----|-----------------|---------------|------|-------|---------------------|
| | Maximum | | | | Minimum | | | | Mean | | | | KES | LKL | ALR | LV |
| | KES | LKL | ALR | LV | KES | LKL | ALR | LV | KES | LKL | ALR | LV | | | | |
| | °F | | | | | | | | | | | | in | | | |
| January | 42 | 42 | 39 | - | 21 | 19 | 18 | - | 31 | 31 | 28 | - | 0.27 | 0.20 | 0.41 | - |
| February | 42 | 43 | 41 | - | 24 | 23 | 23 | - | 32 | 32 | 32 | - | 0.51 | 0.35 | 0.52 | - |
| March | 54 | 54 | 52 | - | 28 | 28 | 32 | - | 41 | 42 | 42 | - | 0.91 | 0.84 | 1.06 | - |
| April | 53 | 54 | 50 | 53 | 28 | 28 | 32 | 26 | 41 | 41 | 42 | 40 | 1.03 | 1.06 | 0.44 | 0.95 |
| May | 74 | 74 | 71 | 75 | 39 | 35 | 41 | 36 | 58 | 57 | 56 | 57 | 0.65 | 0.36 | 0.52 | 0.51 |
| June | 73 | 74 | 69 | 75 | 40 | 35 | 41 | 38 | 58 | 57 | 56 | 58 | 0.22 | 0.16 | 0.07 | 0.40 |
| July | 82 | 83 | 79 | 83 | 47 | 41 | 45 | 44 | 66 | 64 | 63 | 65 | 0.19 | 0.11 | 0.83 | 0.94 |
| August | 86 | 87 | 83 | 87 | 48 | 43 | 44 | 45 | 68 | 66 | 64 | 67 | 0.05 | 0.24 | 0.02 | 0.23 |
| September | 78 | 77 | 76 | 78 | 40 | 35 | 36 | 37 | 59 | 56 | 56 | 58 | 0.62 | 0.57 | 0.67 | 0.95 |
| October | 66 | 67 | 64 | 67 | 32 | 26 | 29 | 28 | 49 | 46 | 46 | 47 | 0.31 | 0.27 | 0.91 | 0.43 |
| November | 48 | 49 | 46 | 50 | 26 | 23 | 26 | 24 | 37 | 35 | 36 | 36 | 2.49 | 2.02 | 3.07 | 2.39 |
| December | 36 | 37 | 37 | 39 | 23 | 23 | 22 | 24 | 31 | 31 | 30 | 32 | 2.46 | 1.92 | 3.96 | 1.98 |
| Mean | 61 | 62 | 59 | IN ¹ | 33 | 30 | 32 | IN ¹ | 48 | 47 | 46 | IN ¹ | | | | |
| Total | | | | | | | | | | | | | 9.71 | 8.10 | 12.48 | (8.78) ¹ |

¹ Datum incomplete.