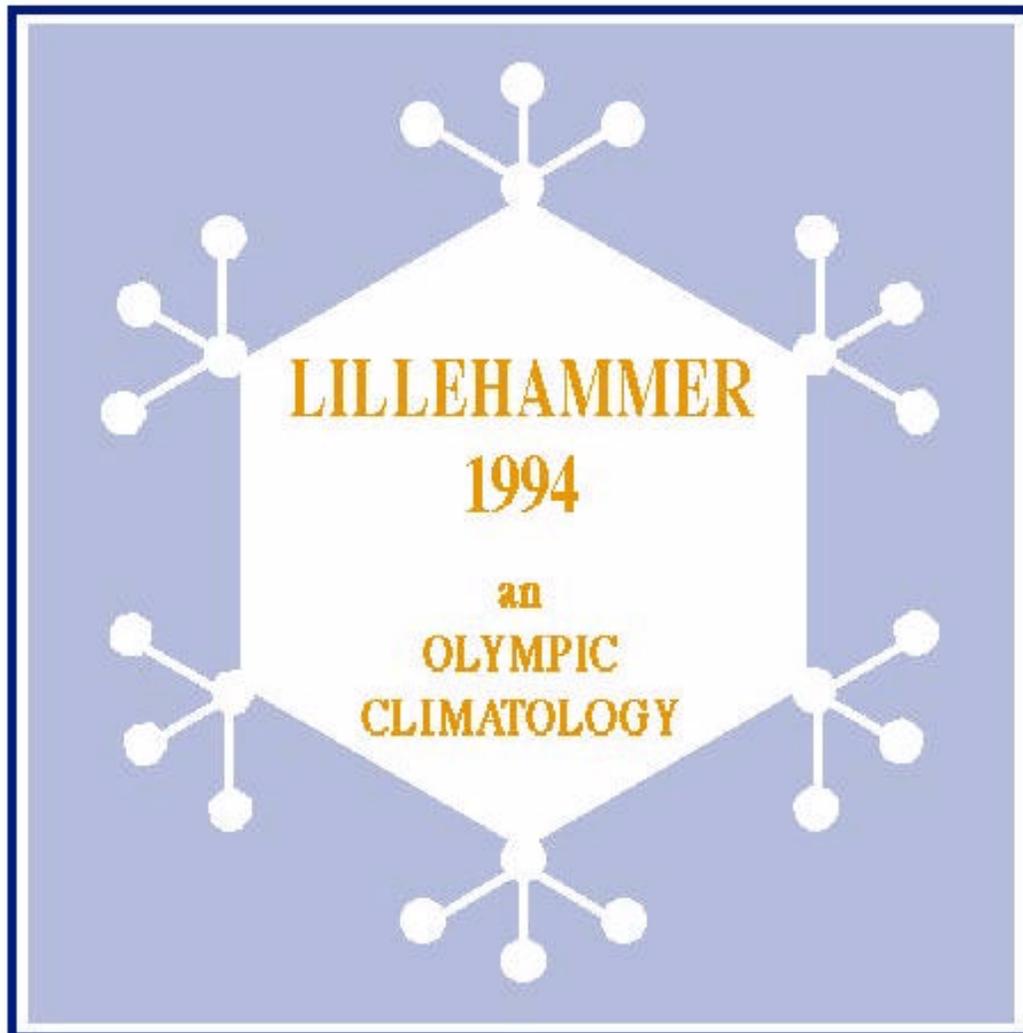


NATIONAL CLIMATIC DATA CENTER

RESEARCH CUSTOMER SERVICE GROUP



NEAL LOTT
Physical Scientist



TOM ROSS
Meteorologist

NARRATIVE DISCUSSION

Norway is predominantly a rugged highland with extensive mountain areas, long coastlines with deep fiords, and steep interior valleys. Icefields and glaciers cover portions of the higher elevations. Norway extends for about 1100 miles from south to north between 58 and 71 degrees north latitude and has an area of 125,000 square miles (324,000 sq km)--about the size of New Mexico. The highest mountains are located in the south (west of Lillehammer) where numerous peaks exceed 6000 feet (1830 meters).

The mountains extend all the way to the coast in many sections, forming deep fiords.

Lillehammer lies at an elevation of 794 feet (242 meters), but with much higher elevations to the west. Lillehammer's northern latitude of 61 degrees North restricts the amount and intensity of sunlight during the winter months. The sun in February is low on the horizon and the intensity of daylight is weak with the maximum number of hours of daylight being seven. However, the period of twilight is often protracted during clear sky conditions.

The climate of Norway is primarily controlled by the moist winds which often accompany storm systems moving in from the west. These westerly winds are relatively warm due to their passage across the waters of the North Atlantic. On average, the ocean water temperature off coastal Norway is about 10 degrees Fahrenheit (F) warmer than average for this latitude--a direct influence of the Gulf Stream. These winds have their most pronounced affect on the coast and along the western slopes of the mountains. In these areas, precipitation is frequent and often heavy, with rain often occurring along the coast and snow falling in the mountains. Annual precipitation at some of these locations often exceeds 80 inches (203 centimeters). In many ways, this is similar to the Pacific Northwest coast and mountains of the United States.

Due to the shielding affect of the mountains, interior Norway (including Lillehammer) is less affected by these stormy conditions. Higher pressures over interior Europe also tend to block the movement and intensity of these weather systems. However, the eastward moving storms still bring precipitation to the inland areas. Occasionally during winter, the extremely cold continental air mass which usually lies to the east of Norway will drift westward across the country. However, the mountain chain seldom permits the coldest air to reach the west coast.

During these cold outbreaks, temperatures in Lillehammer will dip to below zero Fahrenheit, and sometimes remain below zero throughout the day. Fortunately, skies are mostly clear and winds are light during these severely cold events.

The following tables provide details about Lillehammer's February climate. Lillehammer experiences generally light winds with frequent but often light snowfall. Snowstorms do occasionally occur and can produce snowfalls of 6 inches (15 centimeters) or more in 1 to 2 days. One snowstorm in February of 1989 produced 14 inches (35 centimeters) of snow in 2 days. However, it is important to remember that snowfall in the nearby mountains will usually be much heavier than in Lillehammer itself. When light snow is occurring in the town, heavy snow could be falling in the mountains. Also, storminess is quite variable--the winters of 1990 through 1993 produced drier than normal conditions, while this winter has thus far been much wetter than recent years over Norway and much of Europe. Some of the storm systems which have produced flooding rains over parts of Germany and France have also produced snowstorms over southern Norway.

Temperatures in Lillehammer are quite variable in February, and have ranged from as low as -19 F (-28 Celsius) to as high as 55 F (13 Celsius) during the past 10 years. Although 17 and 27 F are

the average minimum and maximum temperatures for February, this does not imply that most days will have temperatures near these values. It is interesting to note that annual extremes during the past 10 years have ranged from as low as -24 F (-31 Celsius) to as high as 89 F (32 Celsius).

For further information, the reader may contact the National Climatic Data Center (NCDC) in Asheville, NC. NCDC has additional information about Norway and Lillehammer's climate available upon request. Also, NCDC has digital datasets (e.g., magnetic tape, diskette) with climatic data for Norway. For information and ordering instructions, please contact the Climate Services Branch (phone 704-271-4800, fax 704-271-4876, internet orders@ncdc.noaa.gov).

LILLEHAMMER, NORWAY CLIMATIC SUMMARY FOR FEBRUARY

(Based on 10-year period--1984 to 1993)

('%' indicates % frequency of occurrence for the condition shown)

Winds:

Average speed - 4 knots (2 meters/second)

Maximum reported (sustained wind from hourly report, gusts would be higher) - 27 knots (14 meters/second)

0-10 knots (0 - 5 meters/second) wind speed - 99% of time

N to NE winds bring coldest temperatures

S to SE winds bring warmest temperatures

Comments: Winds are usually light due to the 'blocking' affect of the mountains to the west. Calm or near-calm conditions are rather frequent during February. However, in the nearby mountains where some of the Olympic events will be held, winds will tend to be stronger. For example, climatic data for several nearby locations reveal sustained winds occasionally exceeding 40 knots (21 meters/second) in February during the past 10 years.

Cloud Ceiling-Visibility:

Unlimited ceiling with at least 10 mile visibility - 36%

Ceiling at least 7000 feet - 37%

Ceiling at least 1000 feet - 86%

Visibility at least 10 miles - 72%

Cloud Coverage:

	Clear	Scattered	Broken	Overcast	Obscuration
7 AM	13%	20%	23%	28%	15%
1 PM	8%	19%	45%	15%	14%
7 PM	11%	27%	31%	21%	10%
Overall	12%	22%	31%	24%	12%

Scattered = 1/8 to 4/8 coverage

Broken = 5/8 to 7/8 coverage

Overcast = 8/8 coverage

Obscuration = Obscuring phenomenon such as fog

Comments: As the above table indicates, the sky is either overcast or obscured by fog approximately 36% of the time in February. However, clear to partly cloudy (1/2 or less cloud cover) conditions prevail about 34% of the time. The nearby mountains tend to have more cloudiness.

Relative Humidity (mean):

7 AM - 91%

1 PM - 84%

7 PM - 85%

Overall - 87%

Comment: Relative humidities tend to be high due to cold temperatures. However, this should not be taken to indicate a prevalence for damp conditions.

Weather Conditions:

	Rain/Drizzle	Snow	Precipitation	Fog
7 AM	1%	16%	17%	11%
1 PM	4%	19%	21%	10%
7 PM	3%	15%	17%	7%
All hours	2%	17%	18%	9%
Daily	14%	65%	71%	34%

Comments: Precipitation (rain, drizzle, snow) is considered to have occurred regardless of whether it was measurable. Light snow (sometimes not measurable) occurs rather frequently in Lillehammer. 'Daily' indicates the probability of occurrence of each weather condition on any given day during the 1984-1993 period. February precipitation averages 1.22 inches (31 mm) in

melted form (i.e., rainfall plus melted snowfall).

Rain or drizzle occurs most often with winds from the SE or S.

Snow occurs most often with winds from the N, NE, S or SE.

Fog occurs most often with winds from the E, SE, S, or calm.

Snow Depth:

Average - 19 inches (48 cm)

Minimum observed - 0 inches in 1990

Maximum observed - 35 inches (89 cm) in 1988

Comment: Snow depths tend to be greater in the mountains. For example, a nearby mountain location reported a depth of 48 inches (122 cm) in February of 1988.

Temperature (mean, F = Fahrenheit, C = Celsius):

7 AM - 20 F (-7 C)

1 PM - 24 F (-4 C)

7 PM - 22 F (-6 C)

Overall - 22 F (-6 C)

Comment: These are mean temperatures but are highly variable with a standard deviation of about 12 F.

Percent occurrence of temperatures of...

At least 0 F (-18 C) - 98%

At least 10 F (-12 C) - 85%

At least 20 F (-7 C) - 60%

At least 30 F (-1 C) - 29%

At least 40 F (4 C) - 4%

Maximum temperature observed: 55 F (13 C) in 1990

Minimum temperature observed: -19 F (-28 C) in 1985

Highest morning low temperature observed: 44 F (7 C) in 1990

Lowest afternoon high temperature observed: -8 F (-22 C) in 1985

Average maximum temperature: 27 F (-3 C)

Average minimum temperature: 17 F (-8 C)

Avg. number of days with minimum temperature below freezing: 25

Avg. number of days with minimum temperature below zero (F): 2

Dew Point Temperature (mean, F = Fahrenheit, C = Celsius):

7 AM - 17 F (-8 C)

1 PM - 19 F (-7 C)

7 PM - 18 F (-8 C)

Overall - 17 F (-8 C)

Comment: These are mean dew point temperatures but are highly variable with a standard deviation of about 12 F.
