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Iowa's Climate

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Living, as we are in Iowa, we are well aware of the effects upon our activities of the ever changing climate, which is, in itself, the summation of the even more variable daily weather. No one of us can escape the fact that our climate profoundly affects our energy, occupation, recreation, transportation, shelter, and food supply. Nor, are we greatly surprised to learn that its stimulation determines the state of our health or the kind of literature we read. It sets the stage for certain kinds of crimes committed against our society and directs the time of seizures of the physically and mentally handicapped. We well remember long, dismal winters with frequent snowstorms persisting into spring which brought on epidemics of "cabin fever" amongst our populace. This same kind of irritation, resulting from the climate and the conditions it imposed in the past, produced mass unrest and immigrations into sunnier climates. Variously, northern Greece, Rome, Great Britain and Normandy were chosen to escape less tolerable climatic conditions over northern Europe. In more recent times local migrations into the sunnier southwest U.S.A. served the same purpose.

The interest of mankind in climatology dates back well beyond our records of civilization. Man's earliest writings reference the climate and its effects. To this day, that interest has been sustained, as evidenced by the climatic network of observations maintained worldwide. In response to our own needs we produced sophisticated observers, in the form of satellites viewing the world's weather from platforms in the sky and radars periodically pulsing their inquiring energy beams outward and recording those replies onto a scope, showing images of clouds and storms. Yet, the most complete weather sensor is the human body, as it senses, the temperature, humidity, wind motion, state of sky, barometric change, impending storm and precipitation patterns. But, in every case specialized meteorological instrumentation is now able to sense more accurately each of those meteorological elements.

In Iowa, weather observations were first begun at Fort Calhoun near Council Bluffs in October 1819. From Fort Calhoun and other locations near Iowa came our earliest climatological observations. In 1838, Iowa's first observations by a private citizen were first read at Muscatine by Theodore Parvin — the father of Iowa's citizen climatology program. Since that date in 1838, citizens from all walks of life and between the ages of 12 to 90 years have been busily recording Iowa's climate. In 1870

the National Weather Service was formalized and in 1875 the Iowa Weather Service began a network of sixty observers. That network has now grown to nearly 300 Cooperative Observers, daily recording our climate. It is this corps of volunteer weather observers who provide us our climatology about temperatures, precipitation, storms, snow depth, soil temperature and evaporation with observations at the same time each day.

In many communities, non-official observers maintain their own daily log of weather and you can, too. Valuable information can be measured without expensive equipment. Wind direction can be visually determined and the speed estimated by using the Beaufort Scale (Fig. 1). Sky condition, cloud type and storm information are useful and easily determined. To be representative, thermometers should be sheltered about five feet above the ground level. For the curious, a set of thermometers can be insulated above the bulb and inserted in the ground to measure soil temperatures.

Fig. 1.

Beaufort Wind Scale

Beaufort Number	Specifications for Use on Land	MPH
1	*Calm; smoke rises vertically*	*1-*
2	*Direction of wind shown by smoke drift but not by wind vanes*	*1-3*
3	*Leaves in constant motion; wind extends light flag*	*4-7*
4	*Raises dust and loose paper*	*8-12*
5	*Small leafed trees begin to sway; crested waves form on inland lakes*	*19-24*
6	*Large branches in motion; whistling heard in highlines*	*25-31*
7	*Whole trees in motion; difficulty in walking against wind*	*32-38*
8	*Twigs broken off trees*	*39-46*
9	*Slight structural damage to buildings*	*47-54*
10	*Trees uprooted*	*55-63*
11	*Widespread damage*	*64-75*
12	*Hurricane*	*75+*

Besides observing daily weather, and analyzing those data, today's student of environment can also sleuth out the secrets of our atmospheric environment in many ways. Those searches can lead him into historical studies, by searching logs, journals and histories to reveal the weather of decades or centuries past; or it can turn to the cause and effect series such as studying the micro-climates across a backyard, or correlating the best temperatures for tomato set, or the weather producing the sweetest strawberries.

The historical student may prefer to analyze tree rings to infer the climate past, or to dig through the varves in an old lake to measure the annual erosion and probable rainfalls. Other students prefer to search out weather lore and proverbs to understand the weather effects upon life and make their own forecasts. For the avid photographer, the opportunity is daily available to record a cloud series, a drop of dew, steam fog, or plant and animal responses to each atmospheric turn.

Some serious weather observers sharpen their "single station" forecasting ability by recording the time series of pressure rises and falls, to interpolate timing of storm arrivals. The astute observer may also choose to pursue a phenological bent, that is, correlating corn, pea, lilac, alfalfa, and oak leaf development to the growing degree days. For example, pea development is associated with days averaging above 40°F and corn with daily averages above 50°F.

For all of us the microclimates of our homes and our yards can be measured and analyzed to determine the best plant environments. The overhang of the house produces a desert; the lowlands may be a swamp; the north slope may have a climate averaging several degrees colder; the valley, a source of cold air drainage and not suitable for tender plantings. You may measure and compare soil temperatures beneath bare soil and sod, or the temperature profile of a garden, both horizontally and vertically. In the winter you can blacken snow to measure the differential rates of melting. Your garden, your yard or your home can be completely charted climatically.

Iowa's climate, as our greatest natural resource, is the most variable factor in crop production. We know that our normal weather is nearly ideal for crop production, and that it is those large anomalies (departures from normal) that cause crop failures when our weather becomes too hot, too dry, too wet or too cold. We know that droughts cause more damage to Iowa crops than any other single weather factor, while hail and flood are secondary causes of loss. Those climatic-economic relationships need further study, if we are to accurately assess the probable losses as they occur and to anticipate the final crop reductions.

Thus, it is readily apparent that Iowa's climate directly or indirectly guides our lives including its effects upon our pocketbook, even to the size of our heating and cooling bills, which by the way, may be correlated to the temperature base of 65°F. The climatic analysis of your home may reveal ways of saving fuel and money. The climatic applications to life in Iowa are endless and the relationships to each kind of plant, animal and human activity need to be measured and studied.