

Mysteries of monsoons lead resident on search



a desert place

Natural beauty
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By Marshall Fancher

A discussion among TV weather reporters as to whether the term "monsoon" was properly used to describe our summer weather here in the desert drove me to the reference section of our local library for information.

I do not pretend to be an expert on weather, but I did discover a few facts that are illuminating.

A monsoon is not a rain. It is a seasonal wind blowing from southeast to northwest during the hot season of the year, blowing from a large body of water inland over a large land area.

It differs from a sea breeze in that the sea breeze only blows a few miles inland, while the monsoon covers a very large area and thus is affected by the rotation of the earth. The monsoon tends to rotate in a counter-clockwise direction around low pressure areas in the northern hemisphere.

Monsoons are caused by the difference in the surface temperatures of the sea and land.

Only in comparatively recent times has the term monsoon been used in reference to our desert, although our summer weather is truly monsoonal. The term was originally used to describe the winds of southeast Asia, particularly in the area surrounding the Indian Ocean. There, the monsoon area is very much larger than anywhere else in the world.

Various reference works now enumerate six to ten areas in the world that experience monsoons. It is interesting to note that more than half the population of the world depends upon the rains accompanying monsoons for livelihood, these being chiefly in agrarian areas.

Monsoons are caused by the difference in the surface temperatures of the sea and the land. In the heat of summer, the land becomes much hotter than the surface of the ocean. Although the same amount of sun heat falls on each, the turbulence of the ocean tends to mix the hot and cool water so that the increase in surface temperature is much less than on the land.

The heated land radiates heat back into the atmosphere, expanding the air, causing it to rise and creating a low pressure system.

The relatively cool and more dense air over the ocean then flows inland, bringing with it a high content of moisture which was evaporated from the surface of the ocean.

Simultaneously, from the north the colder, more dense air presses southward, tending in the northern hemisphere to circulate clockwise around a high pressure area.

When the cold front meets the warm moisture-laden air, precipitation is likely to occur. This may be in the form of rain, hail or snow. (It's too hot for snow here in the desert!)

In the area of the monsoon, if the land were level and the coastline regular, the rain might fall evenly over a large area, but the irregularity of the coastline and/or the shape of the mountain ranges complicates the matter considerably.

Also, the strength or weakness of the cold front and the turbulence between the cold air and warm air is a factor. The flow of warm, moist air thus broken up, sets the stage for thunderstorms.

A considerable updraft may be caused by an area of very hot land, carrying the moisture-laden air as high as 30,000 feet into the atmosphere, where it is always cold.

As it rises, the water condenses into clouds known as thunderheads. As the droplets become larger, precipitation occurs, usually accompanied by lightning which releases large amounts of energy.

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If all this seems to be complicated, it should be noted that one of the best encyclopedia articles I read stated the whole process is still very imperfectly understood!

At least we know that the term "monsoon" is appropriate to this region and that it is the moist summer wind from the Gulf that brings our rain.