Alan Betts: Understanding Spring Climate

"Climatologist explains warm April sun" Wednesday April 16, 2008
Nina Keck, VPR news [http://www.vpr.net/news_detail/80158/]

Understanding the difference between weather and climate.
Daily weather forecasts give us a sense of what drives our daily weather.

The climate through the seasons also has many easily understood patterns, but they are generally not well known.

In spring it gets warmer because the sun is returning to the north and getting higher in the sky. But it stays cold until the snow melts, because the snow reflects a lot of the sun's energy (and melting the snow sucks up a lot of heat). Once the snow melts, the sun heats the ground and it melts too, and the surface gets warm. But evaporation is delayed for several weeks because the ground is cold and there are no leaves on the trees. And it is evaporation that cools the earth (and moistens the air).

So there is this period in April in Vermont when, if there is a high pressure and a clear sky, the sun warms the earth, and, because there is little evaporation, it can get quite warm (while the outside humidity stays very low). It seems like a sudden warmth, and coming right after snowmelt, it is. It will last a couple of weeks until the trees leaf-out and the huge increase of evaporation cools the earth. Then on average the temperature will drop about 5 degrees over a week, and with all the evaporation it will also feel more humid.

Then as the sun gets higher in May and June, the temperature will climb again and we will get the warm humid days of summer. [Unless we have a long drought and plants start to wilt, then with less evaporation, it will get very hot and dry under the strong sun.]

This is the general pattern of spring climate, but it is not easy to see as it is broken up by both warm and cold fronts passing with rain showers.

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We will still get some frosts at night, because the air is dry. With little atmospheric water vapor (a powerful greenhouse gas) the earth can cool rapidly to space at night giving morning frosts. So don't plant frost-sensitive things until a week after forest leaf-out, because the boost of evaporation puts a lot more water vapor in the air - and the water vapor greenhouse effect traps the earth's heat radiation. With this 'greenhouse blanket' it is hard to get a frost at night, unless there is a really strong blast of cold, dry air from Canada