

Re: Higher elevations equals more calm weather? Does elevation matter?

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Source: <http://sci.tech-archive.net/Archive/sci.geo.meteorology/2008-01/msg00102.html>

- *From:* Russell <Russell.Martin@xxxxxxx>
 - *Date:* Thu, 31 Jan 2008 13:07:02 -0800 (PST)
-

On Jan 31, 3:18 pm, Crackles McFarly <helpmeplz2...@xxxxxxxxxx> wrote:

On Wed, 30 Jan 2008 17:59:15 -0800 (PST), Russell
<Russell.Mar...@xxxxxxx> sayd the following:

On Jan 30, 7:09 pm, Crackles McFarly <helpmeplz2...@xxxxxxxxxx> wrote:

On Wed, 30 Jan 2008 13:30:32 -0800 (PST), Russell
<Russell.Mar...@xxxxxxx> sayd the following:

On Jan 30, 3:08 pm, Crackles McFarly
<helpmeplz2...@xxxxxxxxxx> wrote:

On Tue, 29 Jan 2008
06:15:37 -0800 (PST),
LiquidSquid
<m...@xxxxxxxxxxxxxxxx>
sayd the following:

Being I live
on a hill in
just this sort
of scenario,
here is what
I
observe:

Re: Higher elevations equals more calm weather? Does elevation matter?

Storms tend to "split" as they approach my location from the west. One half will remain over lower terrain, while the other will head up into higher terrain. The storms tend to not linger where there is an long-term elevation change. To my south it is an average elevation of 1500 ft and increases towards PA, to my north, 650 ft and slowly decreases to lake Ontario. My house is situated on one of the first hills (1300 ft) as you approach Bristol hills from the north, so it is low-lands and fairly flat to the

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north, high
land and
hilly to the
south.

It is
interesting
to watch a
storm make
like a
curve-ball
and head
out
over the
higher
terrain away
from my
location as
my gardens
wither.
Bristol
mountain is
the usual
target for
many of
these
storms, as it
is one of the
highest
elevations
around at
over 2200ft.

The nastiest
storms are
immediately
to my north,
which is
partly due
to the
deeper
atmosphere
providing
more
energy, and
partly due
to

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convergence
between
lake
Ontario,
Lake Erie,
and over
land.

In all, even
though I am
at a higher
location, we
are in a
transition
zone, and
more often
than not, the
storms miss
us. In fact it
is quite
frustrating
as I enjoy a
good storm.
When we
do get a
storm, we
get a
little more
lightning
activity, but
600 feet of
change
from
average
topology
does not
mean much
to a 2-mile
long
lightning
stroke.

So to
answer your
question:
There are
many more

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factors than
two point
locations
that need to
be taken
into account
to predict a
trend. In my
location the
lakes
provide the
greater
influence
over storm
paths than
the hills do.
Down in
PA where
they are far
enough
away from
lakes,
the hills
have more
influence
(plus they
are larger).

Well I was comparing two
cities near me and their
storm activity and
recorded severe weather
events.

Johnson city TN compared
to Chattanooga TN.

JC is about 1,000 ft above
sea level Higher than
chattanooga, and it
bears out in the noaa data
that JC gets far fewer severe
events than
chattanooga.

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The same goes for the data
on the appalachian mountain
cities.

It seems the more of a
plateau or mountain you're
on the less chances
of severe weather.

We have a tiny mountain in
town but you could drive
your car around it
in less than 5 minutes, so the
differences in weather are
not extreme
except for winter weather
like snow.

Of course their is the odd
thing I love about last night.
It never
stormed, not even lightening
or thunder YET we had a
'severe
thunderstorm warning'
because of 58+ mph wind
gusts.

Kinda like a flood warning
in the desert and it's not
been raining.
Weird stuff.

One day I'll get over my
fascination with weather but
I suspect I
won't realize it since I'll be
dead.

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Anyone has anything else to
add PLEASE do so.

I hate the politico posts just
like you do.– Hide quoted
text –

– Show quoted text –

Topography certainly can influence the weather, but as LS points out it is due to more than just vertical displacement alone. And one also needs to keep other factors in mind when looking at things like storm statistics. Without looking up the climate statistics, I'd guess Johnson City and Chattanooga are in similar general climate regimes, but they are separated by enough horizontal distance that they might not be exactly comparable. Also Johnson City is much smaller, at least by population and presumably also somewhat proportionally by area, than Chattanooga, so the "target" that each represents for severe weather may be different. And larger cities will tend to be in the valleys, so there is a potential sampling bias from that. And since severe weather is comparatively rare, there are possible statistical sampling differences, although those should tend to go either way when looking at a large number of different locations. I think that just how much such factors account

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for differences is difficult to say without careful study. With as many variables as there are in weather, it is sometimes difficult to separate the various contributions.

Cheers,
Russell

I've read up on the severe storms, what ingredients need to be present.

1. Steep lapse rates.
- 2, vertical shear
3. low pressure nearby
4. diving jet stream.

1,2,3 or all 4 is needed for severe storms that I've studied. Of course you can just have excessive heat, 100F+, on a clear day and have storms popup like mad.

With all those present it stills seems less severe, at least less frequent, in places of higher elevation.

Am I catching on to this at all?

Perhaps I should pick 2 data points closer as you suggested.

How about Johnson City and Knoxville Tennessee. They're much closer but the elevations are very different.

The more variables that you're not interested in that you can minimize the differences of, the better. Other than the summer

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I spent in Knoxville, I don't have much experience in the area, and when I was there it had pretty boring weather. Careful observation and long familiarity with the weather in an area is very helpful when one studies such things.

Any opinions?

Also you mentioned severe as being relatively rare but I seem to think it's more common. Is this because of my location's experience, in other words am I biased?

In part I was referring to trying to establish differences, and compared to regular weather one might be interested in, especially temperatures, severe weather is rare most places. I mean, you have temperature every day, so the samples are larger than for severe weather. Also it depends on what you mean by "severe". If you include all thunderstorms there will be more instances than if you only consider storms that produce hail, wind, etc. that satisfy NWS criteria for "severe". I wasn't sure which you're interested in.

I know the overall odds of being killed by a tornado is 1 in 2 million but if you live in tornado alley those odds approach more like 1 in 500,000

That last number seems low to me if it is per year, but maybe it's correct. Anyway, you're right that where you live can make a difference.

Again, am I getting any of this correct?

thanks for your time.– Hide quoted text –

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I think you're on the track. During the time I spent in Knoxville, I think there were two days with severe weather, but it was a fairly dry summer despite the almost constant forecast of "chance of afternoon thunderstorms", so you probably have a better feel for how the weather usually behaves where you live than I do.

Cheers,
Russell

What about a more broad risk of severe weather. Not including tornadoes, say only severe thunderstorms?

In my city we 'average' 75 thunderstorm days per year but obviously all those times are not severe.

I made a chart about this for 2007 and the number that actually turned severe was under 5%.

That sounds like a reasonable value, although someone like Harold would probably know better than I what the general fraction is.

What made my jaw drop was the local forecasts accuracy, something around 66% which I thought was low.

What does that 66% represent, fraction of the time that thunderstorms were forecast and actually occurred?

Forecast verification is a whole can o' worms. Entire book chapters are devoted to the techniques. The book *Storm_* discusses it in the local office context. I used to do that as part of my job at CPC, where it was comparatively easy.

I included all surrounding counties and if a drop of rain hit anywhere I called it correct. 33% of the time they blew it.

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There is a tendency to overwarn, which varies from office to office. This is also discussed in Authors of the Storm. In a broader sense, as Bohr said, "Prediction is difficult, especially the future."

But back to elevation. I guess I was trying to find an escape plan by moving to a higher elevation without having to move west of the rockies.

You don't have to move west of the Rockies, since a move east of the Rockies could also decrease your risk from severe thunderstorms, but some other risks would probably increase. It is probably easier to have a safe storm shelter, weather radio with auto warning activation, and a weather eye, but no system is perfect.

I once was called yearly for a hurricane outlook by someone who lived in Florida and was terrified of hurricanes, but couldn't or wouldn't move. I have a friend who is scared of tornadoes, for good reason, but still lives in Iowa. At least you're planning.

I've enjoyed this conversation with you Russell..

Thanks. Hope it helps.

Cheers,
Russell

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