Outage time of that for Utah (c=0.25)
will have 24 times (6/0.25=24) the
example: A system designed in Florida (c=6)

Climatic/Terrain Factor

Annual average temperatures

US Climatic/Terrain and Temperature Regions
Atmospheric Absorption and Rain Attenuation

- Attenuation increases with frequency.
- Resonance at 22 GHz & 183 GHz (water vapor) and 60 & 1.19 GHz (O2)
Due to rainfall
Crane rain model: additional outage

Dependent coefficients:

\[ a, b: \text{Frequency/polarization} \]
\[ D: \text{Distance (miles)} \]
\[ R: \text{Rain rate (mm/hr)} \]

\[
\frac{90 + 4D}{1.1609} = 90 + 4D
\]

- Fade margin as a function of rain rate
- Heavy rainfall \( \rightarrow \) short hop distances
- Depends on drop size distribution, duration and rain rates

Hydrometeor Attenuation
and rain-rate

Gives additional rain-induced outage depending on the region

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Crane Model Table