
ANALYZING CLIMATE DATA FOR WILDLIFE STUDIES

Phillip Farnes, Snowcap Hydrology, PO Box 691, Bozeman MT. 59771-0691

Climate is one of the driving forces affecting wildlife and fisheries. Access to daily data from SNOTEL stations in the mountains and Climatological stations in the valleys provides data on temperature, precipitation and snow that can be interpreted to help understand response to climate variables. Dates of spring and fall green-up, growing degree-days and forage production can be derived. Snow water equivalent (SWE) can be estimated from Climatological stations. Start of snow accumulation, maximum accumulation and date of maximum SWE, and date of melt-out can be determined for each station. Critical temperatures are different for each species and accumulated effect of cold temperatures can be determined from daily minimum temperatures. Long-term trends and annual variations can help explain fluctuation in population, reproduction, predation and mortality. Relationships have been developed relating plant phenology to climatic variables for lilacs (which have been used as a surrogate for estimating growing seasons) and Whitebark Pine. SWE can be related to migration and predation

Keetch Byram Drought Index (KBDI) was developed for fire spread analysis but can also be used as an index to soil moisture. Index of Winter Severity (IWS) can be calculated for various areas and species using a combination of SWE, forage production and critical temperatures. Streamflows can be related to SWE, soil moisture, spring precipitation and temperatures.