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Guide to the Science of Climate Change in the 21st Century

Chapter 3
Weather vs. Climate

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3. Weather vs. Climate

It is very important to understand the distinction between ‘weather and climate’.

> Weather happens day to day (moment to moment) – best forecast is no more than 10 days. Weather typically includes parameters such as precipitation and its form (rain, snow), temperature (maximum, minimum, average), humidity, wind speed and direction, sunshine hours (cloudiness) and more. Weather forecasts may be made on an hour-by-hour basis. Weather descriptions can be used to describe local regions that might be quite small in area.
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> Climate is a long-term average of weather typically including precipitation and average temperature – averaged over a season (several months), years, decades or much longer. Climate is used to describe large regions that are geographically homogenous.

The climate of a region, short and long term, will not only determine its physical nature but also the characteristics of its biosphere – plants and animals. If the climate of a region is known weather patterns can often be inferred.

We are discussing ‘climate’.

There are numerous factors affecting weather and climate. Most of the major ones are shown in Figure 2.1. The complexity is obvious. The challenge is to know what their effects are and how they relate to each other to determine weather and climate. This is possible by identifying the important subsystems and understanding how they interact. Subsystems of particular interest are the energy budget, carbon cycle and hydrologic cycle. With this knowledge naturally occurring and human influences can then be understood.

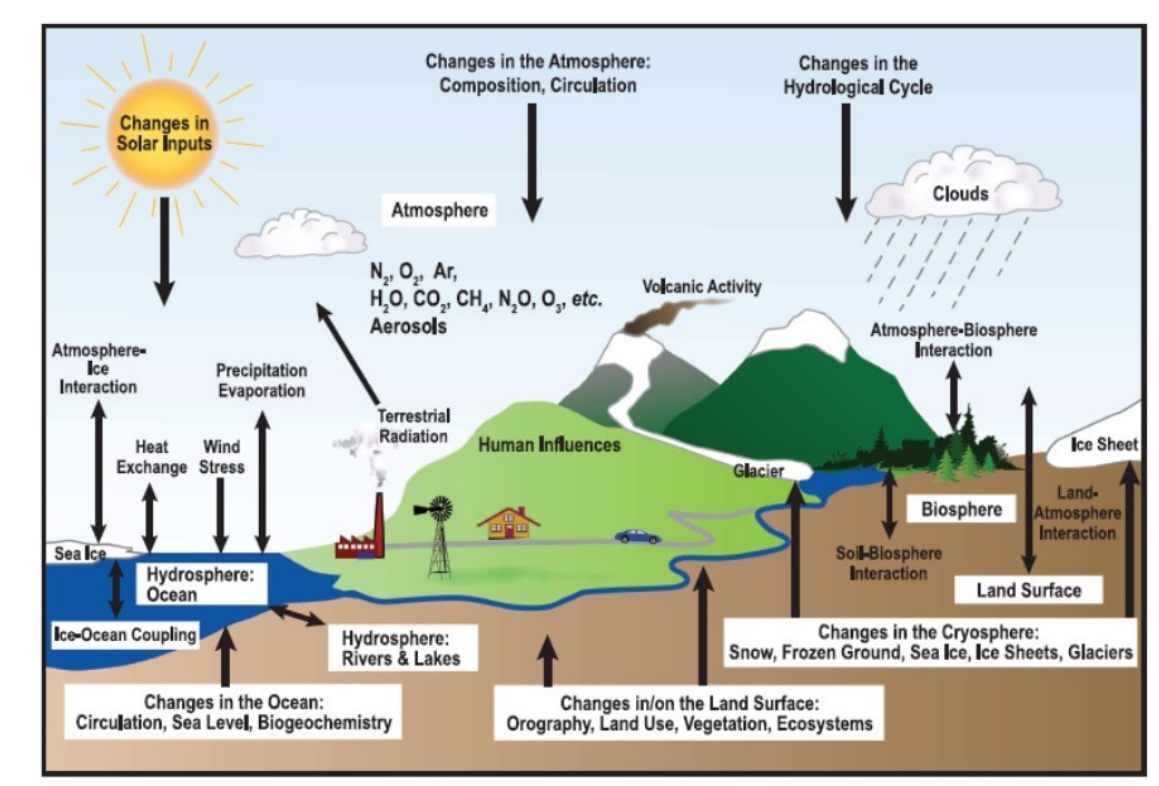

Figure 2.1 Factors affecting weather and climate.
https://www.ipcc.ch/site/assets/uploads/2018/03/TAR-01.pdf