# Unit 1: General Review and Global Circulation Concepts

## Learning Objectives

At the end of this unit, learners should be able to:

* Define basic spatial and temporal scales of motion in the atmosphere, such as synoptic, mesoscale, microscale
* Recall the basic force balances found in midlatitude synoptic flows, and understand why this balance is a poor approximation in the tropics
* Using the principle of mass continuity, infer regions of upward or downward motion on a surface pressure map.
* Distinguish among polar, midlatitude, and tropical weather phenomena in terms of their frequency and size
* Identify the origin of an air mass based on its temperature and humidity
* Describe the general structure of a midlatitude cyclone in terms of front and conveyor belt concepts, and understand the limitations of the conceptual models
* Be able to identify jet streams and jet streaks in upper air charts and on satellite imagery
* Describe the general circulation of the atmosphere and the mechanisms that support the existing pattern
* Define the tropics in terms of the general circulation of pressure and wind systems
* Identify the semi-permanent highs and lows in the tropics and subtropics
* Describe the seasonal migration of the tropical circulation systems, such as the equatorial trough and ITCZ, and their hemispheric differences
* Describe the typical zonal and meridional distribution of cloud depth in the trade wind regime