**TERM PROJECT**

**Cold Air Outbreak, Convective Cell Tracking and Life Cycle Study in the Marine Boundary Layer**

The marine boundary layer (MBL) is the lowest layer of the atmosphere that is directly influenced by the ocean. It is typically shallow, but can deepen significantly during cold air outbreaks. Cold air outbreaks are periods of time when cold air blows over a warmer ocean surface, leading to the formation of shallow convective clouds. These clouds play an important role in the regional climate.

This term project aims to examine the diurnal evolution of the boundary layer during a cold air outbreak in the MBL, track and study the life cycle of convective cells in the MBL, and compare the observations to simulations from the CLASS model.

The following data sources will be used for this project:

* Surface station data [ARM site](https://www.arm.gov/data/data-sources)
* Radiosonde data from <https://weather.uwyo.edu/>

The following methodology will be used for this project:

* The diurnal evolution of the boundary layer will be examined by plotting the surface and radiosonde data.
* Convective cells will be tracked and studied using the COMBLE data.
* The CLASS model will be used to simulate the boundary layer at the location and time period of the cold air outbreak.
* The observations will be compared to the CLASS simulations.

The expected results of this project are to:

* Gain a better understanding of the diurnal evolution of the boundary layer during a cold air outbreak in the MBL.
* Identify the factors that control the formation and evolution of convective cells in the MBL.
* Evaluate the ability of the CLASS model to simulate the boundary layer in this environment.

The findings of this project will have implications for our understanding of the MBL and its role in the regional climate.This term project will provide a valuable contribution to our understanding of the MBL and its role in the regional climate.