Section	General Purpose	Key Messages
Abstract	Summary of why we did this, what we did and how we did it.	We use an **LES** to model a dry shear free Convective Boundary Layer (**CBL**). Ten member ensembles are calculated and a range of Richardson Numbers (**R**i) are achieved by varying **Surface Heat Flux** and Background Potential Temperature Lapse Rate (**Gamma**). A new measure of Mixed Layer (**ML**) height (**h_0**) based on the **Potential Temperature Profile** is introduced. **h_0** serves as the lower boundary of the Entrainment Zone (**EZ**) and shows interesting scaling behavior in particular with respect to **Gamma** while obeying the established **power law relationship** to **Ri**. . To shed light the on resolution required to capture the principal mechanisms of **CBL Entrainment** we compare our results to those of Garcia and Mellado's **DNS** study and find notable agreement.
Introduction	Provide context and introduce what was done.	Predicting **CBL** growth is important and we summarize why. The **CBL** grows by **Entrainment** and we summarize the current understanding of its mechanism. We mention some relevant open questions. We present the definitions of **CBL** height and **EZ Depth** which we use. We give context to our focus on **Surface Heat Flux** and **Gamma** as the two principal parameters governing **CBL Entrainment**. We introduce and briefly explain the scales, parameters and **power law relationships** used in this study.
Tools and Approach	Describe the tools used and how they were set up. Bridge to the Results section.	We describe the **LES**. We describe the domain and resolution. We give context to our **Ri** range and present the table of **Surface Heat Flux**(es) and **Gamma**(s). We describe the local ML height (**h_0_l**) measurement method used.
Results	Present findings in an organized way.	We find that the distributions of **h_0_l** become similar when scaled by CBL height (**h**), except at the lowest values. The lowest (scaled) **h_0_l** decrease with decreased **Ri** causing increased negative skew. We find all our heights (defined in the introduction) scale with

		the length scale used in Garcia and Melado's **DNS** study (**L_0**) apart from **h_0**. When we base our lengths on the **unscaled average Potential Temperature Profile** the lines representing the **power law relationship** to **Ri** group according to **Gamma**. These lines then collapse together when heights are based on the **scaled Potential Temperature Profile**. This collapse is due a reversal in the relative magnitudes of **h_0**. Our **power law relationship** of **Entrainment Rate** to **Ri** is in line with theory and the results of other studies. In particular we reproduce the slopes predicted by Garcia and Mellado's **DNS** study. However we note a change in slope with increased **Ri**.
Conclusions	Bridge results to the discussion in the literature.	We find a regression/curve fitting method of determining local ML height (**h_0_l**) less problematic than the **Gradient Method**. We find the **Potential Temperature profile** to be a valid framework for defining **ML height** and **EZ Depth** since our results produce **power law relationships** seen in other studies and supported by theory. Dependence of **EZ Depth** and **Entrainment Rate** on **Ri** changes with increased **Ri** number as evidenced by the curves representing the corresponding **power law relationships**. **Gamma** is a critical scaling parameter in **CBL Entrainment**.