of the effective transport wind.

The above difficulties are severe for individual trajectories. They are less severe for the statistics of an ensemble of trajectories. For instance, over a long averaging time it is the relative spread of the ensemble of trajectories which determines the spread of pollutants from the mean. Therefore, some of the assumptions used by modelers may not be severe in defining a long-term long range plume from a source if deposition and chemical reactions are neglected. However, when deposition and chemical reactions are important such assumptions would introduce some errors. This also limits our ability to properly define the impact of a given source region on a given receptor.

Some models use a constant mixed layer height. Other models use mixing heights which vary in space on a monthly to seasonal time frame. The MEP and ASTRAP models introduce a diurnal variation to the mixed layer height. However, these models do not differentiate between the transport of the masses above the mixed layer and within the mixed layer. The mass remaining within the mixed layer may travel in a different direction from the mass above the mixed layer. The two masses could eventually decouple themselves, so that transporting them as a single "slab" is not a valid assumption. Also, if these masses were to be treated properly the number of trajectories to be computed would become unmanageably large. Trajectory models will not be very efficient for this purpose. Eulerian models may be more suitable.

It has been noted that mass transported above the mixed layer can be decoupled from the surface layer. Thus dry deposition of this mass will be virtually zero. Some models (MOE) account for this indirectly by assuming a smaller deposition velocity. Also, the mass above the mixed layer travels faster than below so that a single slab model could introduce errors in the spread of the trajectories.

Most models ignore mass transported vertically by large scale vertical motions. Clouds are capable of processing a large volume of