Risk Areas Displayed by Plumecast and Conventional Systems

Plumecast risk area plots are better suited to emergency response applications than conventional systems.

Other dispersion models operate by calculating a variation in concentration of material. Typically, this creates a variation across the plume similar to the so-called 'bell curve'. The peak concentration is at the centre of the plume falling further out. The risk area is displayed as an area over which the concentration has fallen to some fraction of the peak.

Plumecast uses a very different approach. It calculates the area over which material could have spread with no assumptions about concentration. This means that it defines areas known to be free of contamination and not merely areas where levels are below some arbitrary level.

The problem with conventional models is that in the initial stages there will be no information on how much material (or what material) has been released. This means that the actual values of material concentration are unknown. Setting a safe zone where concentration is, for example, 10% of peak is meaningless without knowing the peak level.

Fig. 1 on the right shows how information is displayed by a conventional system and Plumecast for an hypothetical source and receptor site. The older system gives an image of the distribution of material and puts the receptor site outside the plotted area. Plumecast displays a larger risk area including the receptor site.

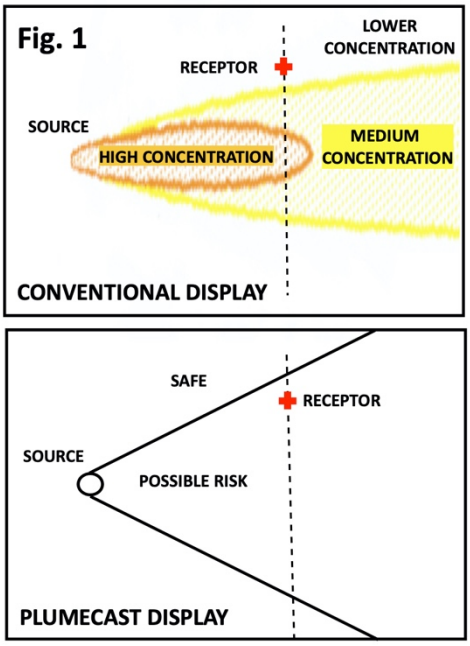
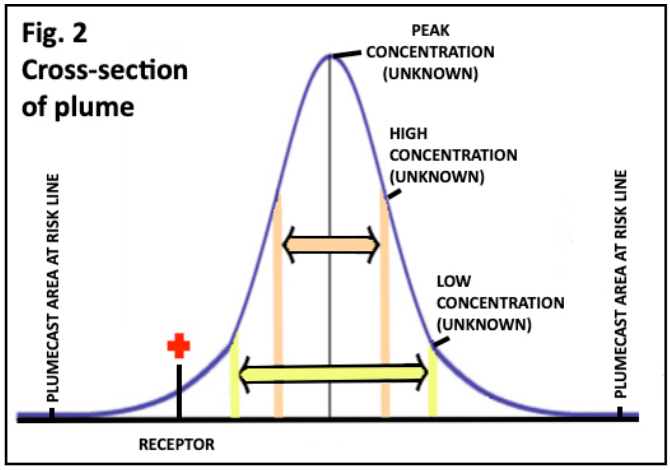


Fig. 2 below shows the profile of material concentration across the plume (the dotted line in fig. 1). The conventional system has calculated a distribution curve and limits for high and low concentrations. Note the actual levels are unknown at this stage. Plumecast instead marks the outer boundary of a possible plume. In this example the receptor site is experiencing a level of contamination but the conventional system does not show this. Plumecast however correctly shows the receptor site as being at risk.



Conventional systems are good at tracking pollution levels or long term transport if the source type and amount are known. But in an emergency response scenario these are not known and these systems can be misleading.