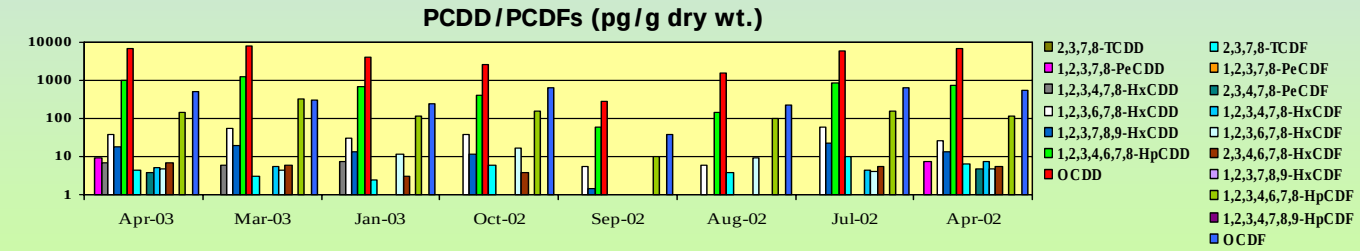
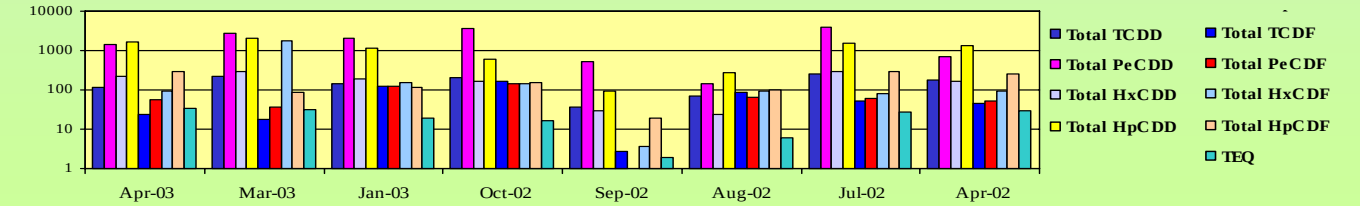
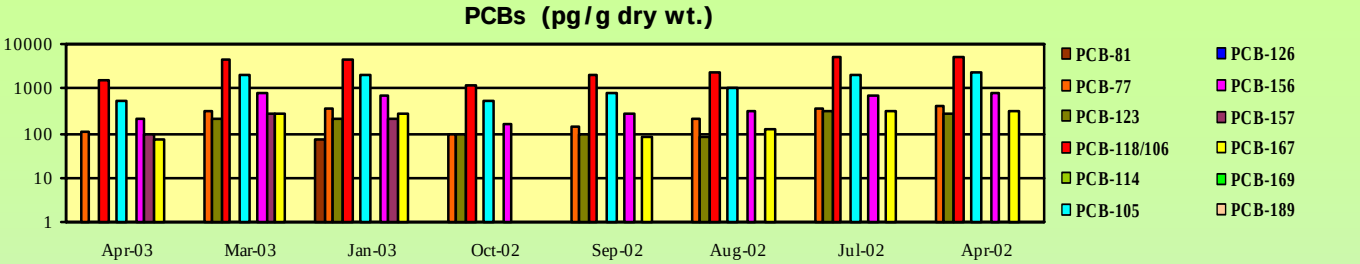
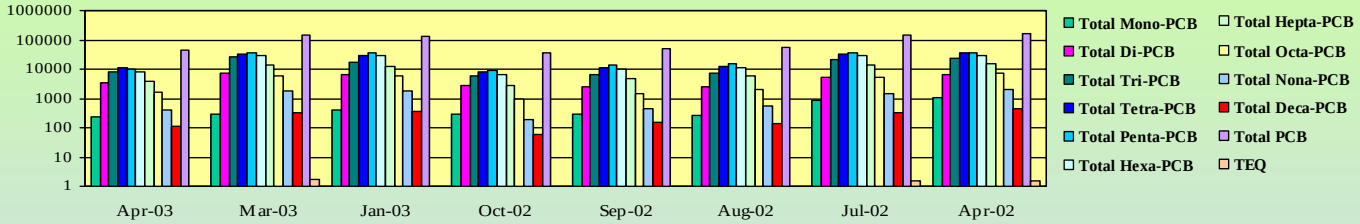
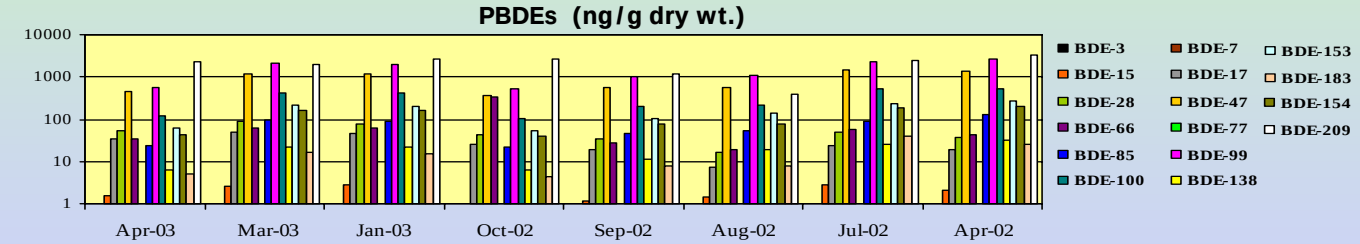
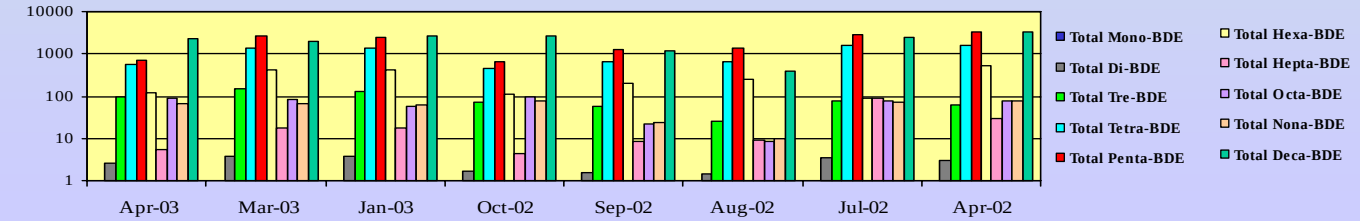
Concentration of PCDD/PCDFs, PCBs and PBDEs in Biosolids

Introduction:

Since the EPA banned ocean disposal of biosolids in 1992, the use of sewage sludge as a soil amendment has increased. In the United States 60% of the biosolids produced by wastewater treatment plants is used for land application. The regulation governing land application of sewage sludge was established in 1993 and is commonly refered to as the Part 503 rule. This rule establishes management practices for land application of biosolids including concentration limits and loading rates for certain chemicals. In large part the EPA relied on the 1988-1989 National Sewage Sludge Survey to identify chemicals to regulate and the concentrations of chemicals that might be present. The standards were established to account for variations in the concentrations of these chemicals with time. This method has been criticized since studies have not been done to show if there is variability in different regions of the US or from different processes.

The graphs shows the month to month variability in the concentration of PCDD/PCDFs, PCBs and PBDEs in biosolids taken from a wastewater treatment plant over a one year period representing eight sampling events. The samples were analyzed using EPA Method 1613 for PCDD/PCDFs, EPA Method 1668 for PCBs and a modified EPA Method 1668 for PBDEs. PCB results are given for coplanar PCBs and total PCBs by homologue group, however full congener data is available. PBDE results are given as total PBDE by homologue group and individual congeners. Retention time windows have been established for each homologue group and total PBDE represents the sum of all of the 209 congeners present.