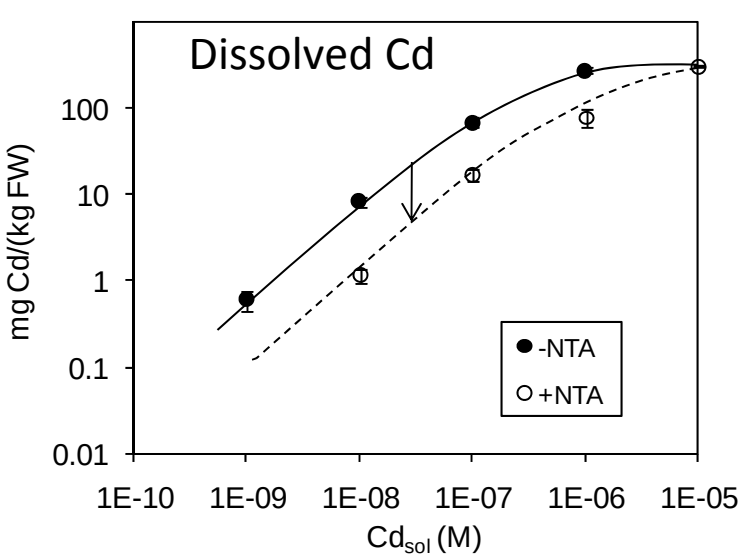
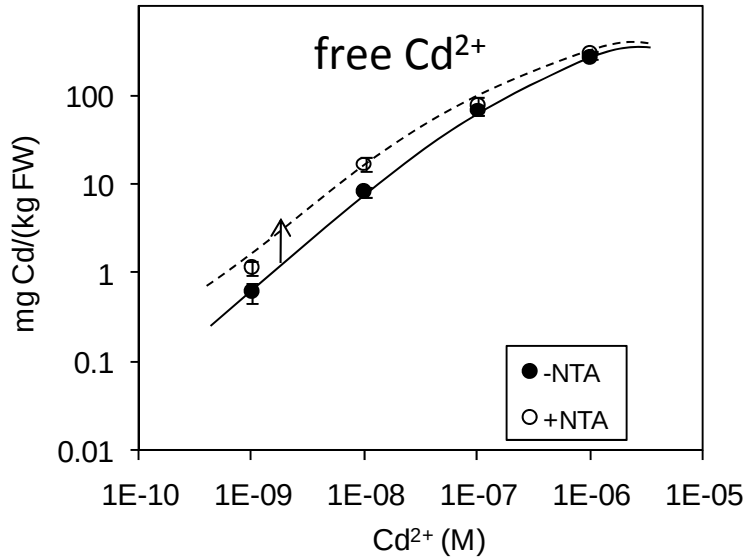
Statement 1: the Free Ion Activity is preferred over metal complexes for uptake in plants; however metal complexes show an 'apparant' availability at low metal concentrations but not at large concentrations

* mechanisms: metal complexes enhance transport of metals to ligand in unstirred layers → FIAM and BLM are conceptually valid at large concentrations (toxicity) but not at low concentrations (bioaccumulation)





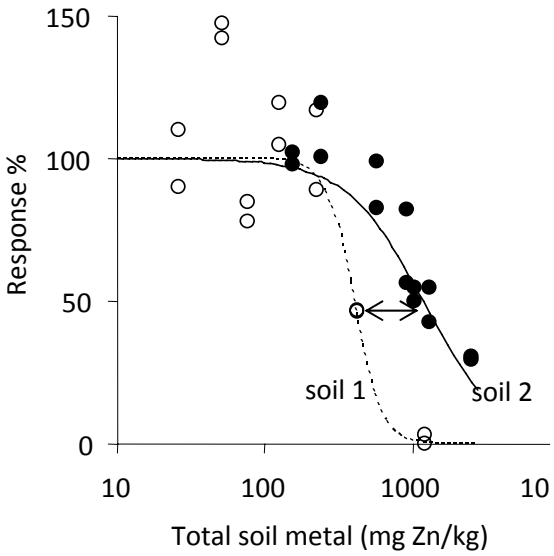
Uptake rate of Cd in plant *Thlaspi caerulescens* in stirred nutrient solution with and without a ligand (NTA) complexing Cd

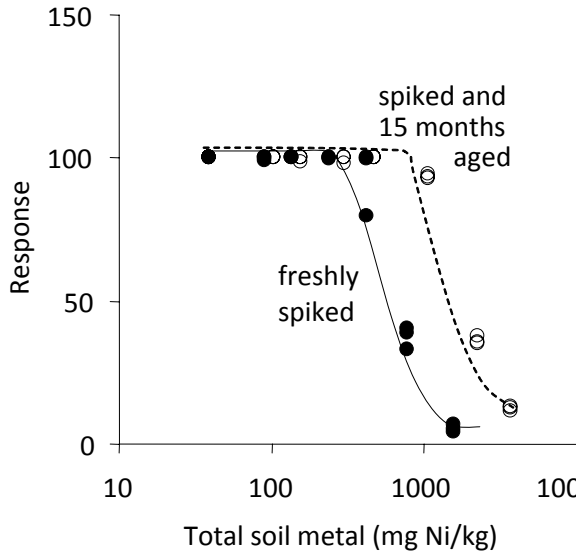
Information? Papers of Degryse et al. (2006-2008), Van Leeuwen and Wilkinson

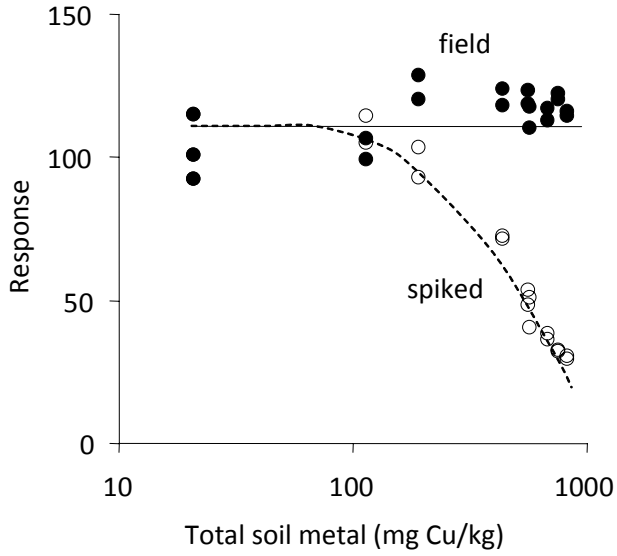
Statement 2

The principal factors controlling differences in toxic doses (as mg/kg) are

- soil physicochemical factors
- ageing
- adapation (ecology!)







Smolders et al. Environ Toxicol Chem, in press

Statement 3

Toxicity data can be modelled with a terrestrial BLM model (Thakali et al 2006), however current models

- are autovalidation based
- input data are relatively complex
- competitive effects in soil are not all confirmed by experiments in isolation

Statement 4

•Empirical regression models (with CEC) and empirical factors linking toxicity in lab with that in field currently allow implementation of bioavailability provided that there is sufficient validation with different species

• Variabiliy in biological response in the field strongly limits the detection of adverse effects!

• More pragmatic (!) research is required to identify tools to bridge the gap between metal bioavailability in metal salt spiked soils and environmentally contaminated soils