Nitrate pollution in groundwater in the lower reach of the Yellow River,- case study in Shandong Province, China-

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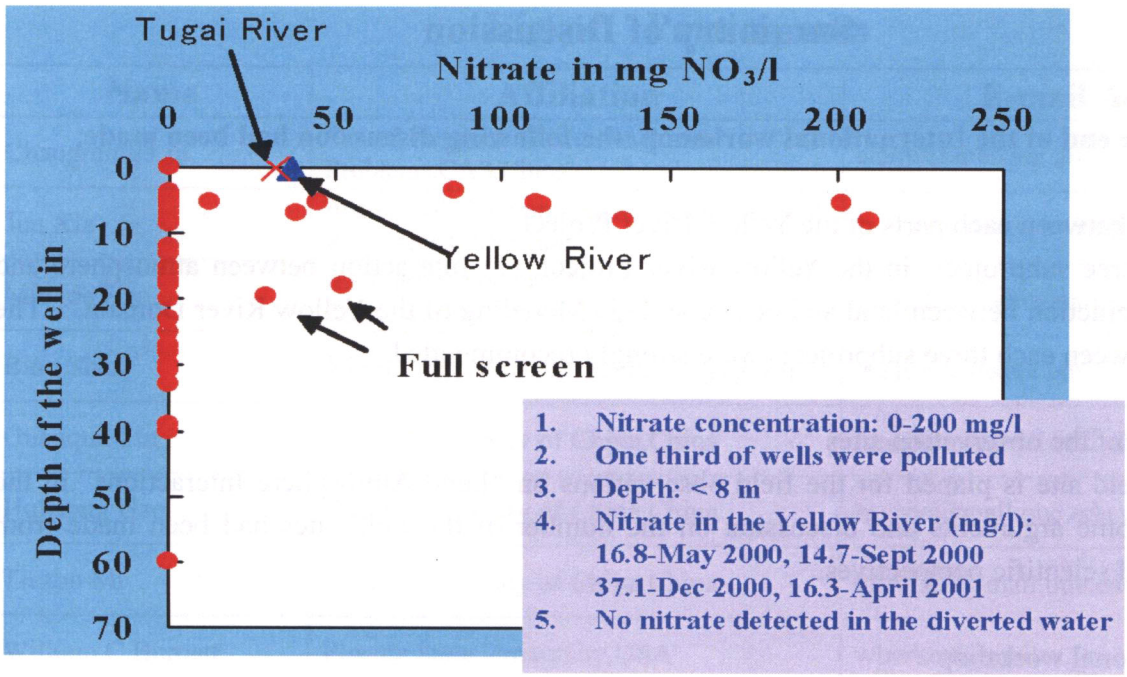
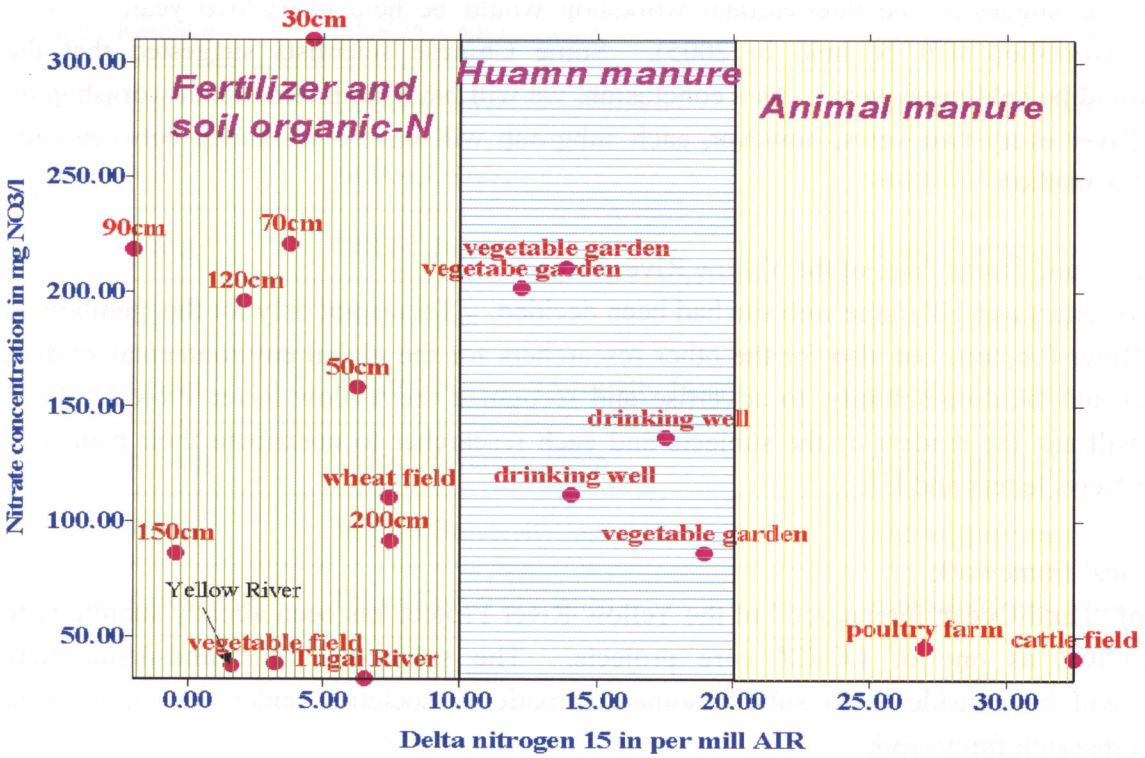
Yucheng and Qihe counties in the lower reaches of the Yellow River tended to be an important agricultural area after the Yellow River water was diverted in 1972. Field surveys and sampling were implemented in the area to examine the nitrate pollution of groundwater, which is recharged dominantly by the diverted water. Nitrate pollution was found to have occurred in the shallow layer of less than 8 m in depth with the highest concentration of more than 200 mg/l. Though nitrate content was found in the Yellow River ranging from 16.3 to 37.1 mg NO_3/l, it was not found in the canal, ditch and pond used to convey and store the diverted water, excluding the N source from the Yellow River. ^{15}N was measured to identify the nitrogen of anthropogenic and fertilizer/soil organic sources. The upward potential gradient of the saturated zone observed in the piezometers at Yucheng Experimental Station, the occurrence of ZFP at 120 cm depth, and denitrification process deduced from the change in $\delta^{15}N$ and SO_4 concentration helped explain why NO_3 was found only in the shallow layer of the aquifer.





Why does nitrate occur only in the shallow surface layer of less than 8 m depth: upward gradient potential in the unsaturated zone; frequent occurrence of ZFP at 120 cm depth in the unsaturated zone; denitrification processes.