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FACULDADE DE CIÊNCIAS E TECNOLOGIA
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Groundwater quality in the agricultural regions, contamination of soils and water by nitrogen compounds and remediation

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http://www.intechopen.com/articles/show/title/chromatographic-polarographic-and-ion-selective-electrodes-methods-for-chemical-analysis-of-groundwa
MARTINEZ, J.L.; MANCUSO, M.A.; **SIMÕES RIBEIRO, M**. (2011) - Nitrate contamination of groundwater by agricultural activities in the protected area of Costa da Caparica (Portugal). II International Congress on Subsurface Environment. October 4 to 6, São Paulo, Brazil, SIMÕES RIBEIRO, M. (2009) – The cenozoic aquifer system of the Lower Tagus Basin: a description of the hydrogeological situation in the Almada region (Portugal). Hydrogeology Journal, 17 (4), p. 999-1009

Objectives

The objective of the research is to evaluate the extent and level of contamination by nitrates and others contaminants in the groundwater and soils resulting from the application of chemical fertilizers and pesticides in agricultural activities.

Methodology

Field methods - Inventory of wells, measurement of water levels in wells, collection of samples of water, and soils. Measurement of physical and chemical parameters of water pumps in wells (pH, Eh, EC, T). Pumping wells and determination of the value of hydraulic parameters of aquifers (transmissivity, storage and porosity).
Laboratory works - Analysis of surface and groundwater samples by chromatographic, polarographic and ion-selective electrodes methods for: pH, EC, HCO_3^-, Cl^-, SO_4^{2-}, NO_3^-, NO_2^-, F^-, PO_4^{3-}, Ca^{2+}, Na^+, K^+ and Mg^{2+}. Study of soil composition, grain size, organic matter, pH, conductivity, oxidation-reduction potential and metals by x-ray fluorescence method for: Al, Ag, As, Au, Ba, Bi, Ca, Cd, Cl, Co, Cr, Cs, Cu, Fe, Hg, K, Mg, Mn, Nb, Ni, P, Pb, Pd, Rb, S, Sb, Sc, Se, Si, Sn, Sr, Te, Th, Ti, U, V, W, Zn and Zr.
In the research are used **mathematical models** for water flow simulation and to understand the chemical evolution of water.

Expected Results

Understand the relationship between the soil and water quality and the uses of pesticides and fertilizers in agricultural practices.

Treat the water and aquifers contaminated by nitrates.

Implement remediation technologies.

Agricultural region in Costa da Caparica, Almada.

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