Geophysical Research Abstracts
Vol. 19, EGU2017-13429-1, 2017
EGU General Assembly 2017

Landscape scale assessment of soil and water salinization processes in agricultural coastal area.

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Soil salinization is among main land degradation process around the globe. It reduces soil quality, disturbs soil function, and has harmful impacts on plant growth that would threaten agricultural sustainability, particularly in coastal areas where mostly susceptible on land degradation because of pressure from anthropogenic activities and at the same time need to preserve soil quality for supporting food production.

In this presentation, we present a landscape scale analysis aiming to assess salinization process affecting wine production. This study was carried out at Serignan estuary delta in South of France (Languadoc Roussillon Region, 43°28'N and 3°31'E). It is a sedimentary basin near coastline of Mediterranean Sea. Field survey was design to characterize both space and time variability of soil and water salinity through water electrical conductivity (EC_w) and soil 1/5 electrical conductivity ($EC_{1/5}$). For water measurements, Orb River and groundwater salinity (piezometers) were determined and for soil 1737 samples were randomly collected from different soil depths (20, 50, 80, and 120 cm) between year 2012 and 2016 and measured. In order to connect with agricultural practices observations and interviews with farmers were conducted.

We found that some areas combining specific criteria presents higher electrical conductivity: positions with lower elevation (a.s.l), Cambisols (Calcaric) / Fluvisols soil type (WRB) and dominated clay textures. These observations combined with geochemical determination and spatial analysis confirm our first hypothesis of sea salt intrusion as the main driven factor of soil salinity in this region.

In this context, identification of salinization process, fine determination of pedological specificities and fine understanding of agricultural practices allowed us to proposed adaptation strategies to restore soil production function.

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Key Words: Salinity, Coastal Agriculture, Landscape, Soil, Water