Developing an integration tool for soil contamination assessment

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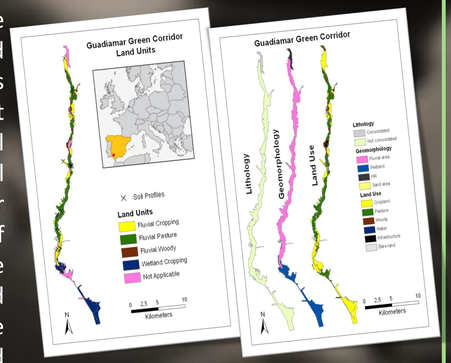
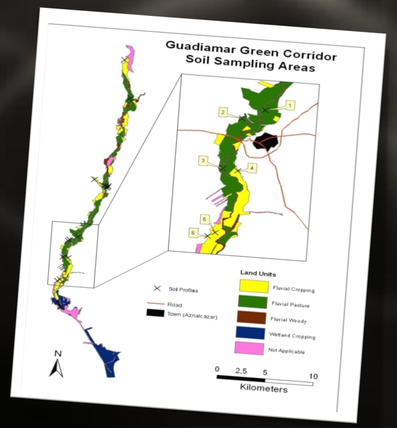
Introduction

The Guadiamar Green Corridor (Southern Spain) was used as a case study, aiming to obtain soil data and new information in order to assess soil contamination. The main threat in the Guadiamar valley is soil contamination after a mine spill occurred on April 1998. About four hm3 of acid waters and two hm3 of mud, rich in heavy metals, were released into the Agrio and Guadiamar rivers affecting more than 4,600 ha of agricultural and pasture land. Main trace elements contaminating soil and water were As, Cd, Cu, Pb, Tl and Zn.

The objective of the present research is to develop informatics tools that integrate soil database, models and interactive platforms for soil contamination assessment.





RECARE Guadiamar database

Description	Unit	Label
PROFILE_ID	-	Profile identification
SAMPLE_ID	-	Sample identification code
LOC_COOR_X	-	Local coordinates X or longitude
LOC_COOR_Y	-	Local coordinates Y or latitude
YEAR	-	Year of sampling
MONTH	-	Month of sampling [1,12]
SAMPLE_DEP_TOP	cm	Sample depth top
SAMPLE_DEP_BOT	cm	Sample depth bottom
HUMIDITY	%	Humidity
OC	%	Organic carbon content
BD	g/cm^3	Bulk density
HUMIDITY_ATM	%	Humidity at 1/3 atmospheric pressure
PH_H2O	-	pH in soil-water suspension
PH_KCL	-	pH in soil-KCL suspension
AMMONIUM	mg N-NH4/g	Amount of ammonium
NITRATE	mg N-NO2/g	Amount of nitrate
P_INORG_AVAILABLE	mg P/g DM	Available inorganic phosphate
P_ORG_AVAILABLE	mg P/g DM	Available organic phosphate
SAND	%	Sand content
CLAY	%	Clay content
SILT	%	Silt content
COARSE	>2 mm	Coarse fragments
CADMIUM	mg/kg^{-1}	Cadmium content DTPA extracted
LEAD	mg/kg^{-1}	Lead content DTPA extracted
COPPER	mg/kg^{-1}	Copper content DTPA extracted
ZINC	mg/kg^{-1}	Zinc content DTPA extracted
TREATMENT	-	Application of amendment [0,3]
CLAY_AMENDMENT	t/ha	Amount of clayey red soil applied between 1999 and 2001
ORGANIC_AMENDMENT_1	t/ha	Amount of compost applied in 1999
ORGANIC_AMENDMENT_2	t/ha	Amount of dung applied in 1999
LIME_AMENDMENT_1	t/ha	Amount of sugar lime applied in 1999
LIME_AMENDMENT_1	t/ha	Amount of sugar lime applied in 2001

Soil sampling using an auger, collecting the top soil (0 -15 cm)

RECARE platform

Guadiamar case of study

Base web platform under construction

Desciption

Public repository: Public information available for stakeholders

- Databases
- Scientific communications
- Legislation
- Other documents

Functionality for model evaluation will be also included. The users will be able for use the models and databases in a easy way