

## Case Study Details

- **Country:** Spain
- **Soil Threat:** Contamination
- **Partners:**  
Evenor-Tech (Partner 9)

# Research progress in remediating soil contamination in the Guadiamar Green Corridor (Spain)

**evenor**  
Solutions for soil  
use and protection **tech**

[www.recare-hub.eu/guadiamar](http://www.recare-hub.eu/guadiamar)

Anaya-Romero, M & Pérez-Alvarez, JM

## Background

- Mine spill accident in 1998 contaminating Guadiamar river basin
- Applied remediation measures (mechanical, soil amendments, phytoremediation)
- No harmonized soil database and spatial analysis for Green Corridor available



## WP 2. Review report

Contribution to the review reports on soil contamination (Anaya-Romero et al. 2015) and on soil function and ecosystem services (Schwilch et al. 2015).

## WP 3. State of degradation and conservation of the Guadiamar site

Contribution to the Report of Case Study descriptions (Tsanis et al. 2015).

### Database Compilation:

- Collecting existing physiochemical soil and land use data of Guadiamar between 1999 and 2002. \*Red de información ambiental de Andalucía. Consejería de Medio Ambiente y Ordenación del Territorio. Junta de Andalucía
- Limiting case study to the Guadiamar Green Corridor
- Creating new Guadiamar database (JRC guidelines) | 18 sampling areas with physiochemical and contamination soil data of topsoil | 872 soil profiles with Cd, Pb, Cu, and Zn contamination of topsoil

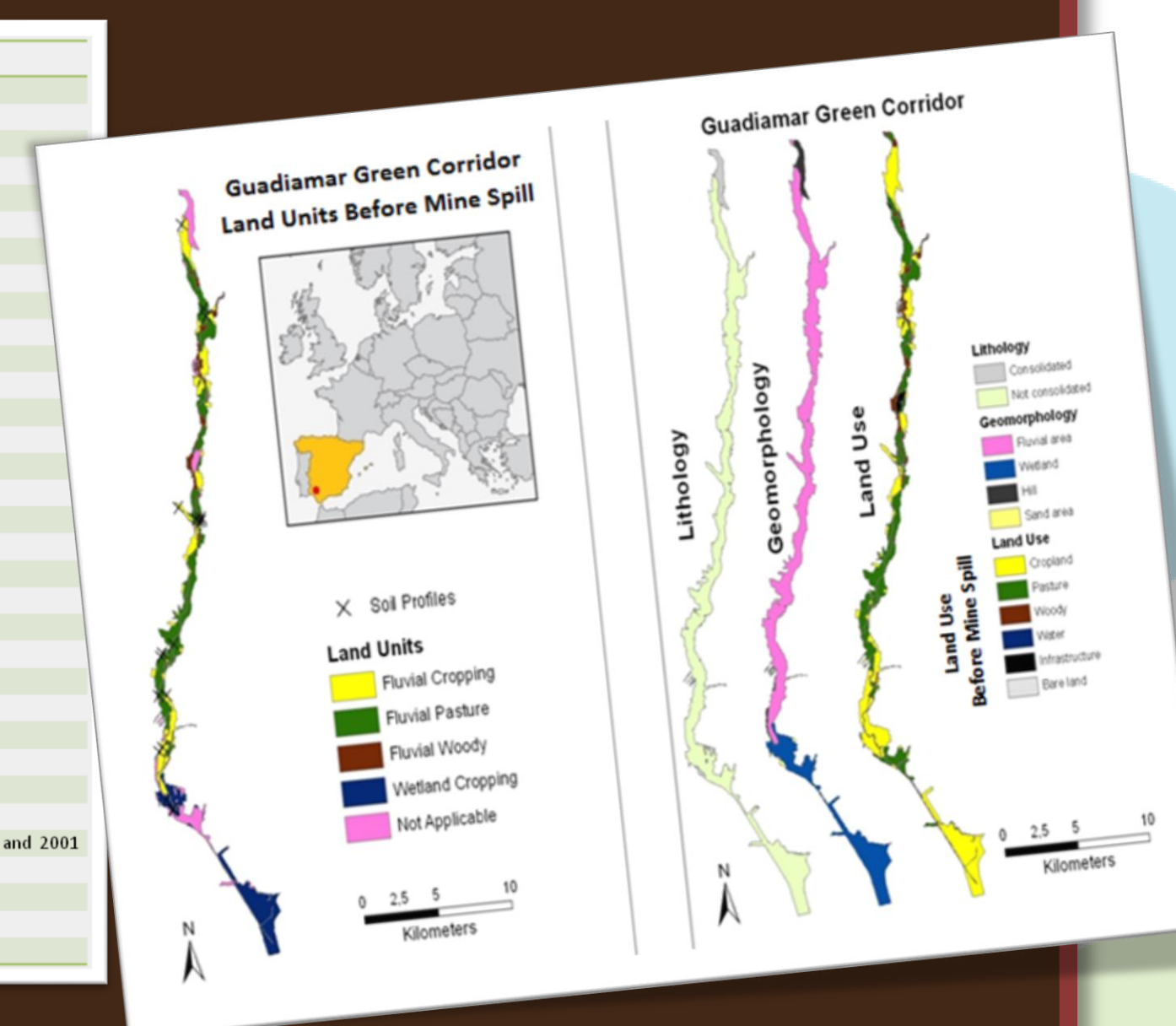
### Statistical analysis

- Topsoil (0 -15 cm) of the 18 sampling areas
- Three sample size are different due to irregular number of analysis made

### Spatial analysis using ArcGIS

Land units for soil data extrapolation. Soil properties of 18 sampling areas  
Contamination data of 872 soil profiles

Description	Unit	Label
PROFILE_ID	-	Profile identification
SAMPLE_ID	-	Sample identification code
LOC_COORD_X	-	Local coordinates X or longitude
LOC_COORD_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
SOC	g 100g <sup>-1</sup>	Soil organic carbon content
BD	g/cm <sup>3</sup>	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-HH4/g	Amount of ammonium
NITRATE	mg N-HO2/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 <sup>-1</sup>	Cadmium content DTPA extracted
LEAD	mg/kg <sup>-1</sup>	Lead content DTPA extracted
COPPER	mg/kg <sup>-1</sup>	Copper content DTPA extracted
ZINC	mg/kg <sup>-1</sup>	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 compost applied in 1999
LIME_AMENDMENT_1	t/ha	Amount of sugar lime applied in 1999
LIME_AMENDMENT_2	t/ha	Amount of sugar lime applied in 2001



## WP 4-5. Stakeholder analysis and Workshop

- Contribution to the Report on Stakeholder Analysis (Leventon 2014).
- Report on the First Stakeholder Workshop (Navarro-Fernández et al. 2015).
- Actually integrating the main technologies/approaches identified into the **WOCAT** questionnaires which are: sludge removal, addition of soil amendments, revegetation (with native species), environmental education, and building a network of information about the site.



## WP 11. Dissemination and Communication

Anaya-Romero M, Maraño T, Cabrera F, Madejón E, Madejón P, Murillo JM, Vrinceanu N-O, Siebielec G, Geissen V (2015). Chapter 8. Soil contamination. In: J Stolte (Ed.). *Soil threats and Soil functions in Europe: A Review Report* (under review).

Anaya-Romero M, Zingg F, Pérez-Álvarez JM, Madejón P, Abd-Elmabod SK. Developing an integration tool for soil contamination assessment. European Geosciences Union General Assembly, EGU2015. Geophysical Research Abstracts.

Anaya-Romero M, Abd-Elmabod SK, Muñoz-Rojas M, Castellano G, Ceacero CJ, Alvarez S, Méndez M, De la Rosa D. 2015. Soil threats under climate change scenarios in the Andalusia region. Southern Spain. Land Degradation & Development. DOI: 10.1002/ldr.2363.

Leventon J (2014). *Stakeholder and Institutional Analysis* (Deliverable 4.1). Chapter 3.15. Case Study 15: Soil contamination in Guadiamar, Spain (pp. 89-92).

Navarro-Fernández CM, Madejón E, Madejón P, Domínguez MT, Anaya-Romero M, Maraño T (2015). Report of the First stakeholder workshop: Participatory identification of measures to combat soil threat in Europe, Aznalcázar (Sevilla), 19 February 20

Zingg F (2014). Evaluate Long-Term Fate of Metal Contamination after Mine Spill; Assessing Contaminant Changes in Soil The Guadiamar Case Study; Southern Spain. MSc Thesis. International Land and Water Management. Wageningen University



Shared information on social networks and local press

Recare-hub customizaton:  
[www.recare-hub.eu/guadiamar](http://www.recare-hub.eu/guadiamar)



The RE CARE project is being coordinated by Wageningen University and AL TERRA – Wageningen-UR

Contact address: Wageningen University, Soil Physics and Land Management Group / AL TERRA, Soil Science Centre / Coen Ritsema,

P.O. Box 47 • 6700 AA Wageningen, The Netherlands.  
T: +31 317 48 65 17 • F: +31 317 41 90 00 • E-mail: [Coen.Ritsema@wur.nl](mailto:Coen.Ritsema@wur.nl) • [www.recare-project.eu](http://www.recare-project.eu)

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Preventing and Remediating  
degradation of soils in Europe  
through Land Care

