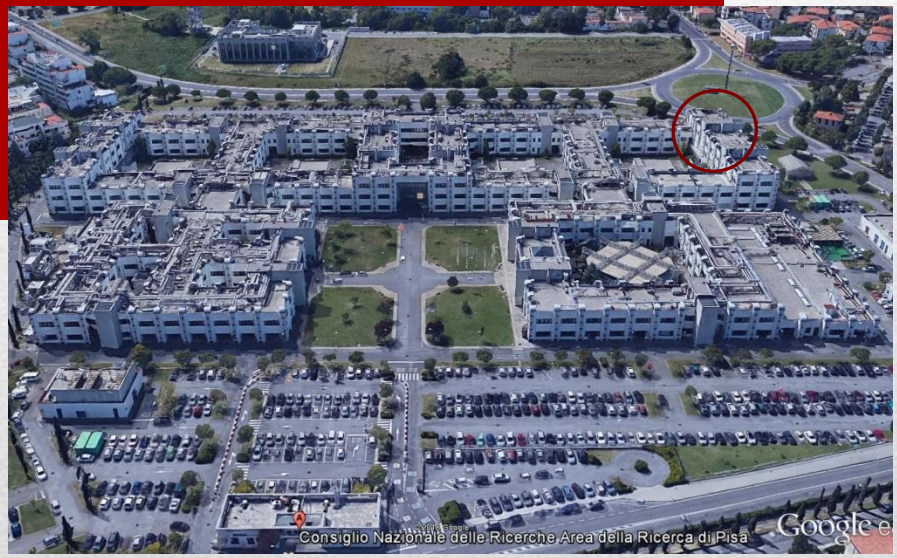
Consiglio Nazionale delle Ricerche
Area della Ricerca di Pisa

CNR-Pisa
The biggest research area in Italy



Institutes:

1. Biofisica
2. Biologia e Biotecnologia Agraria
3. Chimica dei composti organo-metallici
4. Fisiologia clinica
5. Geoscienze e georisorse
6. Informatica e Telematica
7. Istituto Nazionale Ottica
8. Linguistica Computazionale
9. Neuroscienze
10. Processi Chimico-Fisici
11. Scienza e Tecnologia dell'Informazione
12. Ricerca sugli Ecosistemi Terrestri
13. Tecnologie Biomediche

Staff: about 1200 employees

Agrivivai, Pistoia, 19 March 2019

Institute of Ecosystem Study (ISE)

The **Institute of Ecosystem Study-ISE** performs research into the structure and functioning of aquatic and terrestrial ecosystems, focusing in particular on anthropogenic pressure and global change. The ISE knowledge gives the scientific basis for identifying the most appropriate protective and corrective interventions, and provides support for the bodies entrusted with formulating policies for environmental protection and recovery. ISE included 4 units, Verbania (head unit), Pisa, Florence and Sassari. The 20th of September 2018 ISE was abolished. From 21st September ISE Pisa, Florence and Sassari joint with IBAF (Institute of Agro-Environmental and Forest Biology)

I.S.E. + IBAF = **IRET** **(Research Institute on Terrestrial Ecosystems)**

Logo

Logo to be decided into the "first institute meeting" on 9-10 April 2019

The administration is still completely unable to «act» with a huge amount of problems in work development

Agrivivai, Pistoia, 19 March 2019

CNR activity

A. Preparatory actions

A1. Review of the EU and national regulations on the use of sediments for plant nursery and soil rehabilitation and of the analytical protocols **project date 01/10/2018-31/12/2018**

done!!

B. Implementation actions

B1. Analysis and characterization of dredged sediments and green waste (responsible). CNR involvement: physical and chemical characterization of sediments and waste
project date 01/10/2018-31/03/2019 -supposed date 01/10/2018-30/04/2019

ongoing!!!

B2. Sediment and green waste co-composting and analysis of the process. CNR involvement: analysis of the process **01/04/2019-30/09/2019**

to start!!!

C. Monitoring of the impact of the project actions

C1. Monitoring and validation of composted sediments. CNR involvement: physical, chemical and biological analyses
project date 01/01/2019-30/06/2019

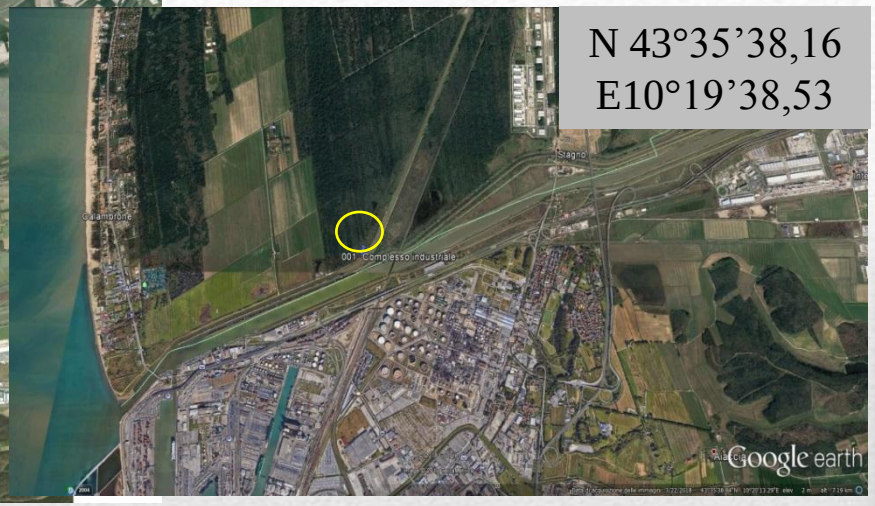
to start!!!

AGRISED

LIFE17 ENV/IT/000269

B1 Action
Sediment collection: on 4th February 2019

Length: 17 km
Width: 30 m
Depth: 3 m



N 43°35'38,16
E10°19'38,53

The dredging of the Navicelli canal is aimed at allowing navigability

About 20 000 m3/year

Navicelli Canal (Pisa), a navigable canal that connects Pisa to Livorno and flows into the sea

Sediment dredged the beginning of January

Agrivivai, Pistoia, 19 March 2019

B1 Action

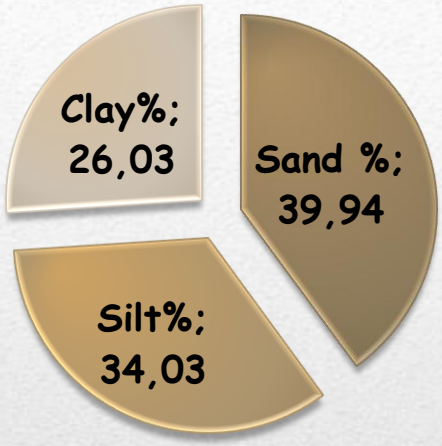
• Sediment characterization:

•Sharing of work between CNR and UNIFI

- **Physical analysis:** Texture, Bulk density, water retention curve
- **Chemical analysis:** pH, Electrical Conductivity, Nutrients Total content and Availability (C, N, P, Ca, Mn, K, Fe, Mg), Cation Exchange Capacity
- **Inorganic Contaminants :** Total heavy metals and available heavy metals (Zn, Cd, Pb, Cu, Cr, Ni)
- **Organic Contaminants**: C>12, IPA, etc…
- **Biochemical analysis:** Hydrolitic and oxidoreductase enzyme activities
- **Biological analysis:** microbial biomass and respiration rates, microbial diversity
- **Toxicity analysis:** germination and root elongation tests, microbial toxicity test, microcrustacean toxicity tests

B1 Action

• Sediment characterization:



Texture

Loam

pH	8,08	±0,04
C.E. dS/m	7,64	±0,02
C.E.C. meq/100g	18,8	±1,20
TOC%	2,10	±0,11
TP %	0,07	±0,02
N-NO3mg/kg	7,57	±0,92
N-NH4 mg/kg	1,71	±0,64

Total Heavy metals

Cu	mg/kg	73,0	±8,5
Zn	mg/kg		±5,3
Cd	mg/kg		
Ni	mg/kg	47,3	±2,4
Pb	mg/kg	22,5	±0,1
Cr	mg/kg	77,6	±3,6

Under the legal limits 152/2006 75/2010

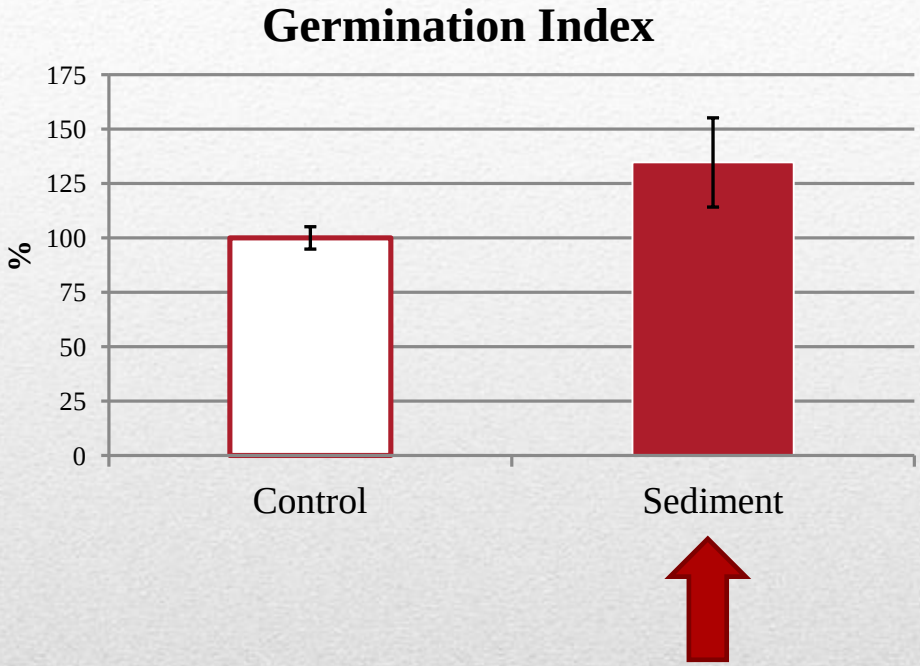
Organic contaminant to be determined

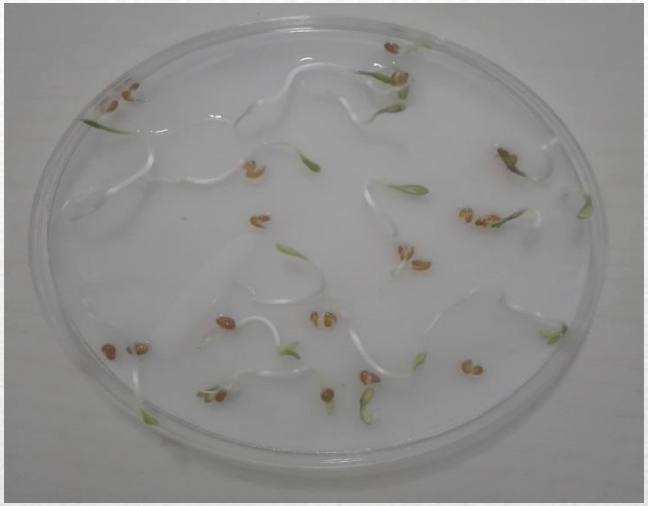
Available Heavy metals

Cu mg/kg	0,22	±0,02
Pb mg/kg	0,05	±0,01
Zn mg/kg	<LOD	
Cd mg/kg	<LOD	
Ni mg/kg	<LOD	
Cr mg/kg	<LOD	

Toxicity analysis

Phytotest: *Lepidium sativum* (crescione)





No toxicity!!!

1. -To complete the analyses on the selected sediment or otherwise, choose other sediment samples
2. -To analyze the green waste which will be used for the co-composting process
3. -To start the co-composting process, as planned

Thanks for your attention