

Defining and Mapping soil based ecosystem services at different scales: a flexible methodological approach at multiple governance levels

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LIFE Programme 2014-2020 (Call 2015)

Save Our Soil for LIFE Title: SOS4LIFE Acronym: Sector: **Resource Efficiency** 01/07/2016 Start: 31/10/2019 End: Total budget : € 1.788.749,00 **EU** Contribution : € 1.060.551,00 **SOS4LIFE**

Save our Soil for Life – SOS4LIFE

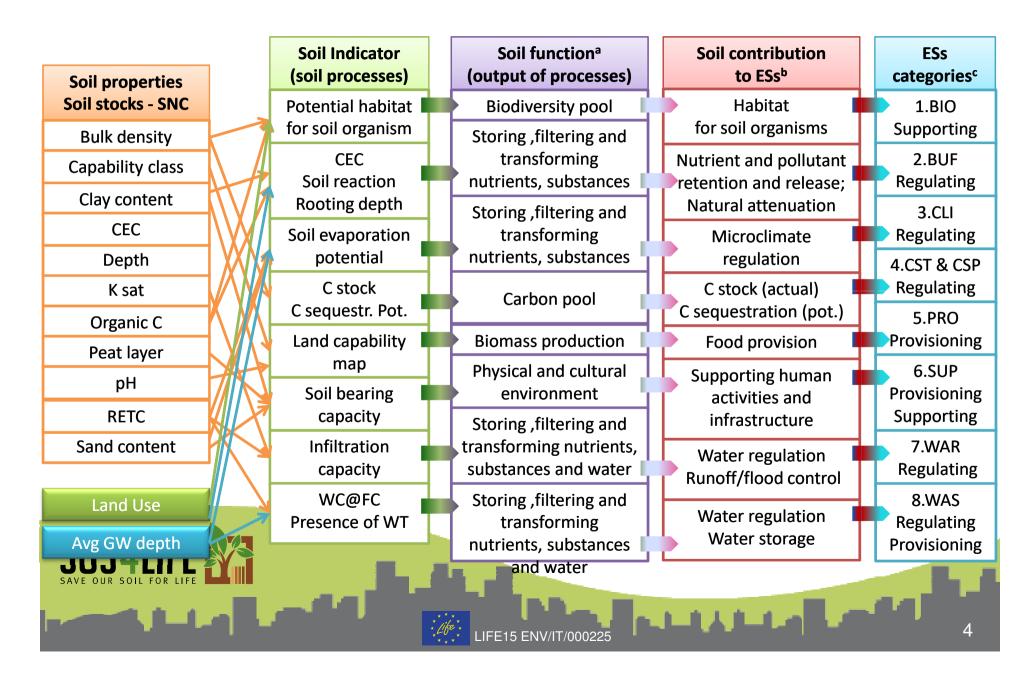


- Evaluate ecosystems services provided by urban and peri-urban soils and quantify costs and impacts caused by land take and soil sealing
- Define a viable regulation framework and operational tools to achieve, at the municipal level, the no net land take target and promote urban regeneration
- Promote and practice **de-sealing interventions** as a way to compensate newly urbanized areas and improve the urban resilience
- Develop a **Urban and Soil Decision Support System** to be adopted by municipalities and regions for monitoring land use change, soil-sealed areas, urban regeneration processes, soil ecosystem services
- Raising **awareness** on the need **to save our soils** among decision makers, technicians, citizenship.



ESs: underpinning soil functions, indicators and data

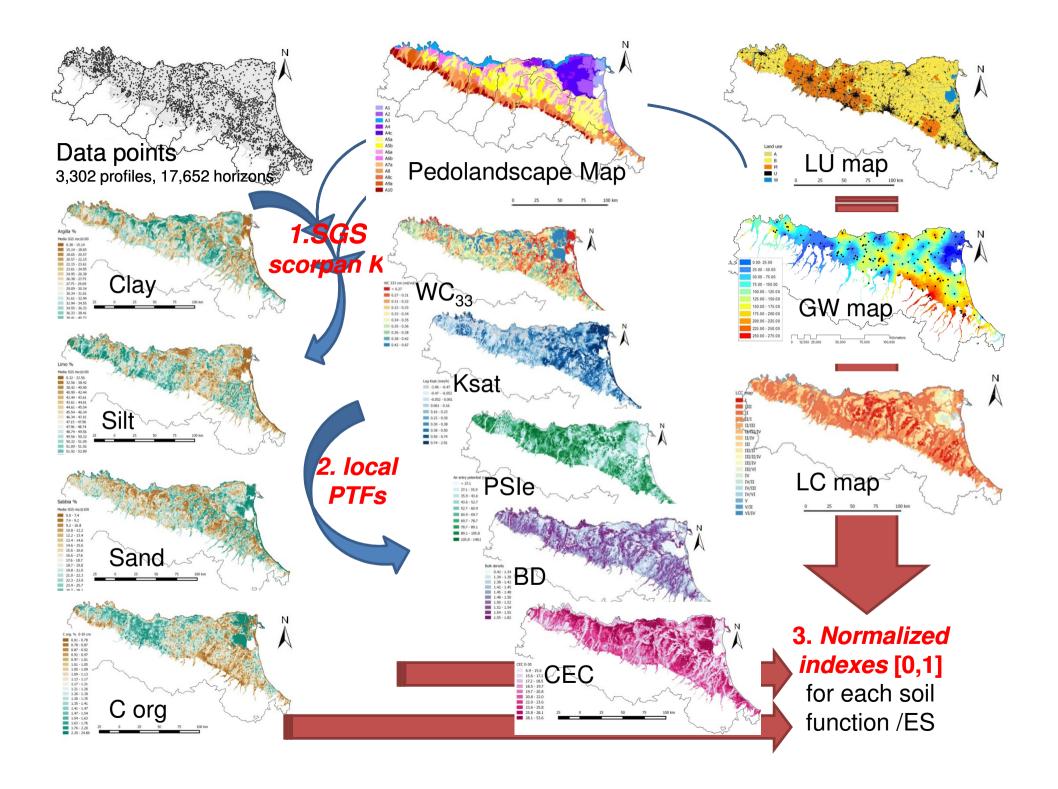






Regional scale





NORMALISED INDEXES FOR EACH SOIL FUNCTION

Provision

Biomass production (PRO)

Regulation

Soil buffer capacity (BUF), Microclimate regulation (CLI) Water storage (WAS), Water infiltration (WAR), Carbon sink actual and potential (CST, CSP),

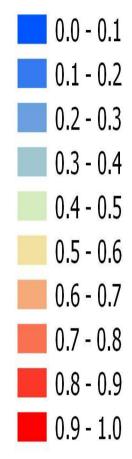
• Support

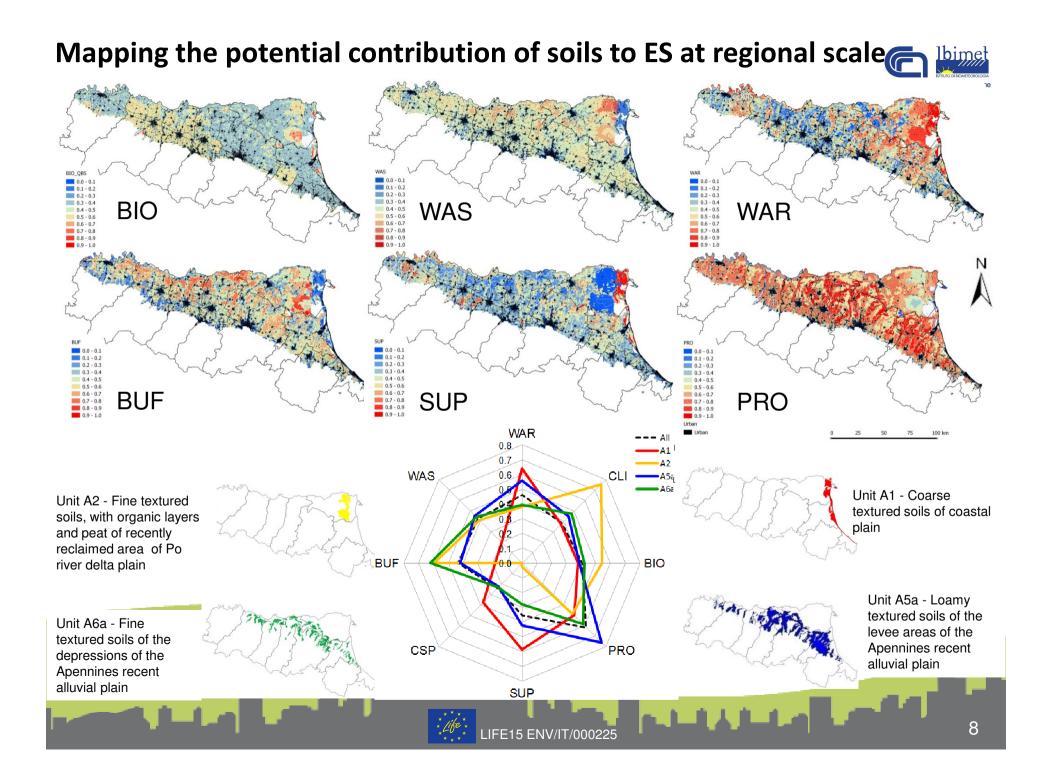
Suport to infrastructures (SUP) Support to biodiversity (BIO)

- Based on existing **data** and **maps**, definition of **indicators**
- Calculation, normalisation (**0-1**) and **mapping** (value 0 indicates the relative minimum for each indicator)



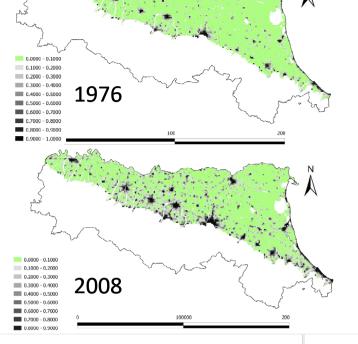






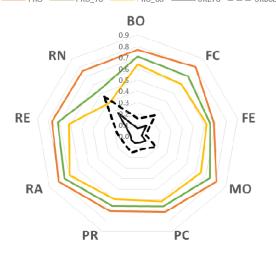
Impact of soil sealing on Ess at regional scale

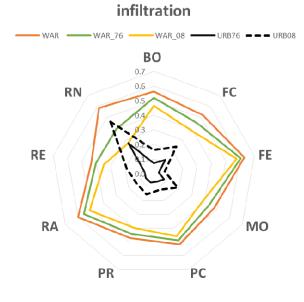




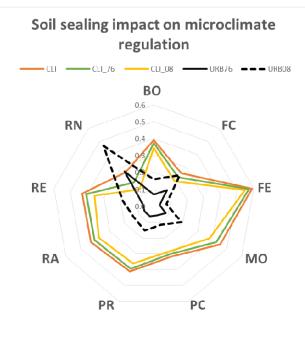
	1976	2008	diff.
PRO	0.693	0.628	-9.4%
BUF	0.515	0.435	-15.5%
WAS	0.425	0.388	-8.6%
WAR	0.504	0.459	-9.1%
CSP	0.306	0.277	-9.5%
SUP	0.389	0.36	-8.1%
CLI	0.414	0.383	-7.6%
URB	0.067	0.149	122.4%





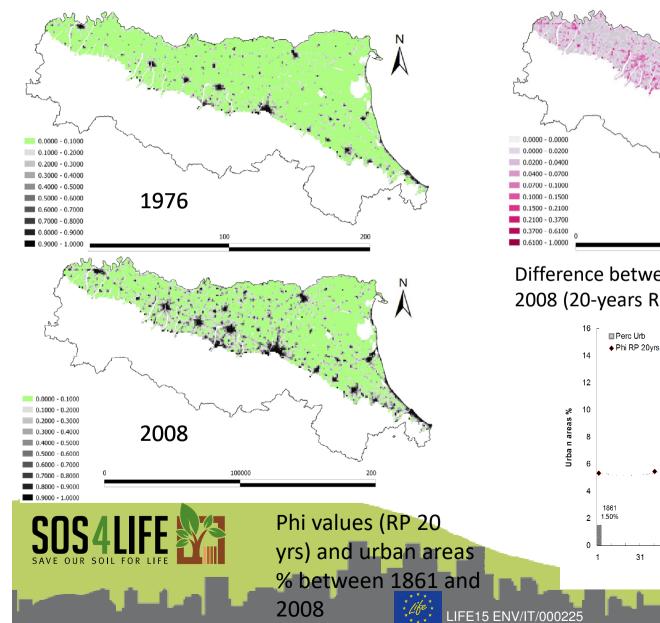


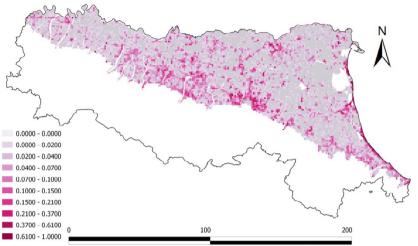
Soil sealing impact on water





Impact of soil sealing on runoff





Difference between the Phi values at 1976 and 2008 (20-years RP)

0.74

0.73

0.72

0.71

0.7

0.69

0.68

0.67

0.66

0.65

151

Phi (-)

Runof

10

2008

15.10%

2003 13.1%

1976

6.76%

121

1954

2.54%

91

Years

31

61



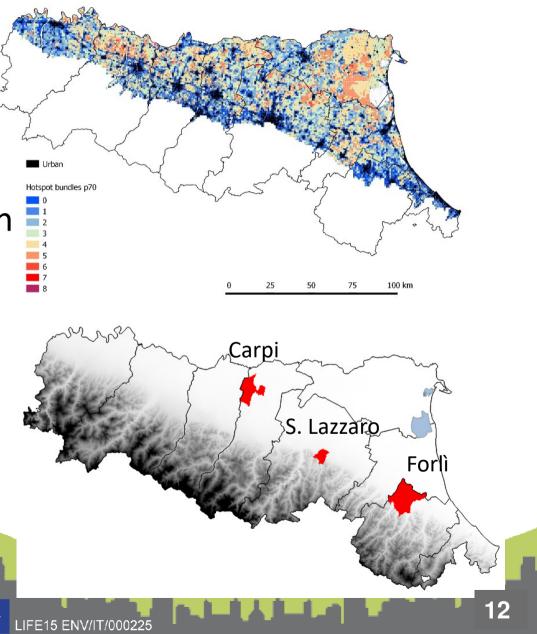
Municipal scale

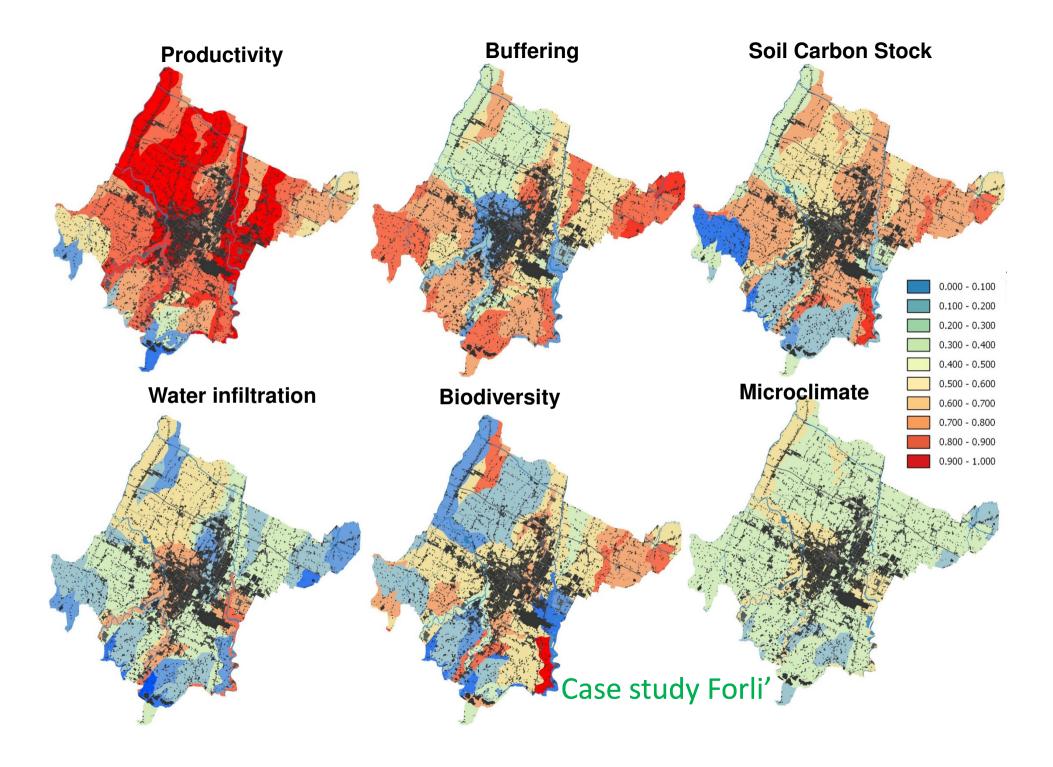


Ecosystem Services at municipal scale and soil sealing impacts

- •Potential productivity
- Water regulation
- Microclimate regulation
- Support to biodiversity
- Soil Carbon Stock
- Buffering

SOS4LIFE

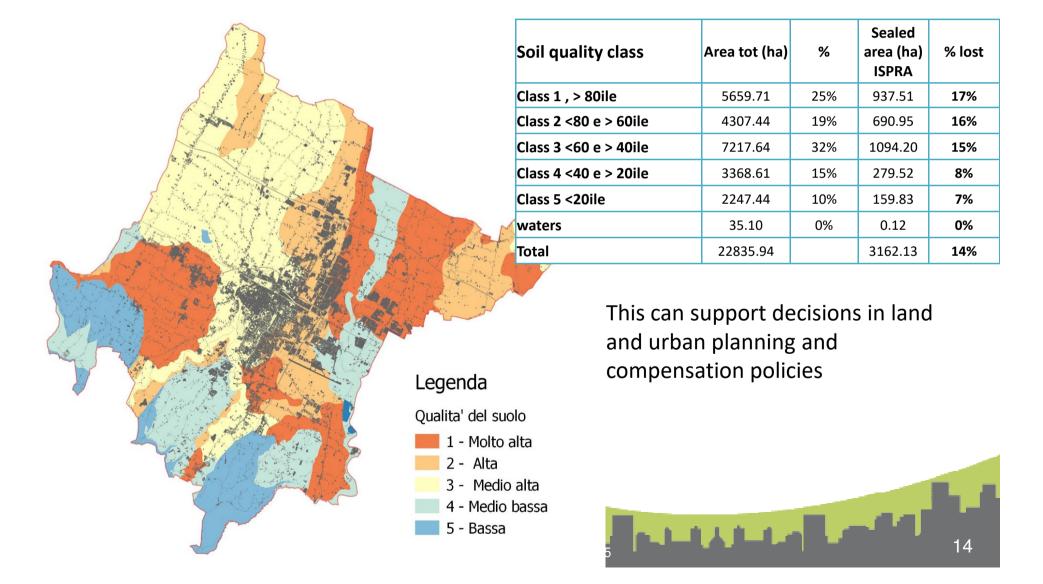




Soil quality assessment to support compensation



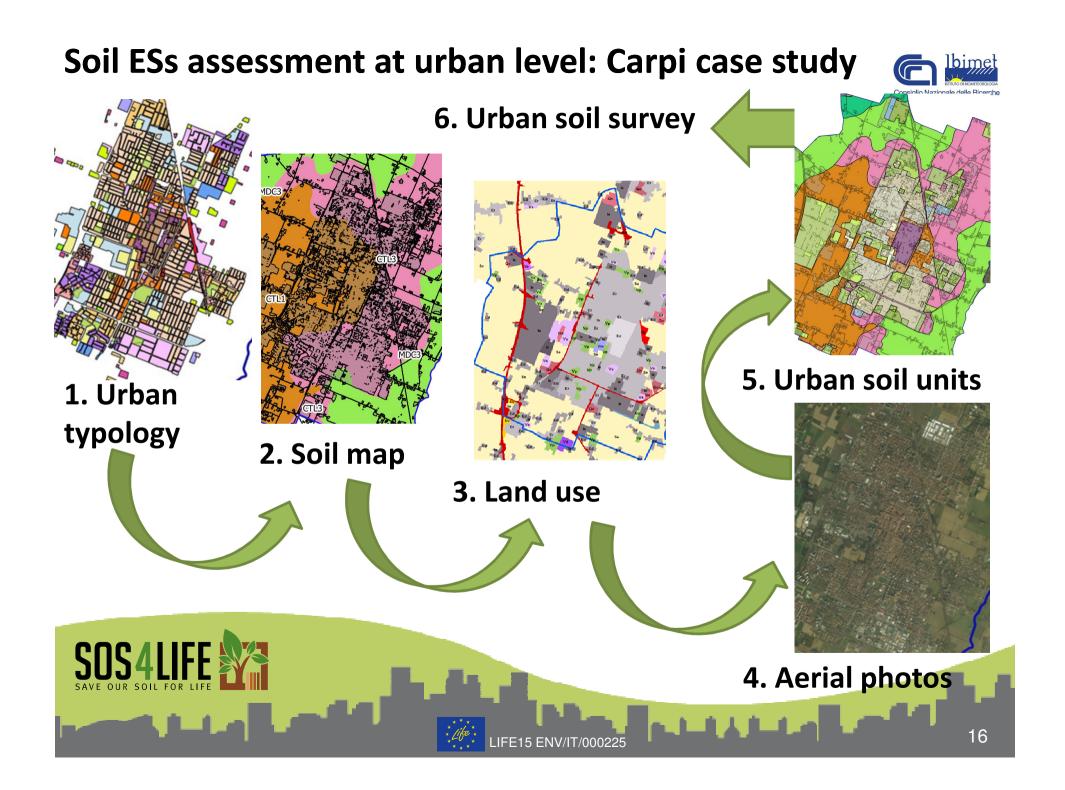
Overall soil quality can be then assessed as the sum of indicator values, then scaled 1-0. Soil quality classes are defined based on centiles of the distribution.





Urban scale





		 <i>A</i> <i>C</i> <i>F</i> <i>S</i> <i>N</i> <i>S</i> <i>S</i> <i>N</i> <i>S</i> <i>S</i> <i>N</i> <i>S</i> <i>S</i>	rilevamento AG GP RT 5P /I urbani ACTL1 BCTL1 BCTL3 CCTL3 CCTL3 CCTL3 CCTL1 CCTL3 CCTL1 CCTL3	E7415 CARPI (MO DOS4LIFE	T65 18/10/17 SDS4LIFE TA		tine Ricerche
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	2	parchi	aiuole	agineoio	sportivo	industriale	
M. Stand	ACTL1	parchi 7	aiuole 2		sportivo	industriale	9
No CARE TA	۷	-			sportivo	industriale	
	ACTL1	7	2		sportivo	industriale	9
	ACTL1 BCTL1	7 3	2	1	sportivo 1	industriale	9 5
	ACTL1 BCTL1 BCTL3	7 3 4	2 2			industriale	9 5 4
	ACTL1 BCTL1 BCTL3 CCTL1	7 3 4 24	2 2 2	1	1		9 5 4 28
	ACTL1 BCTL1 BCTL3 CCTL1 CCTL3 CMDC3 CTL1	7 3 4 24 31	2 2 2	1	1		9 5 4 28 39
	ACTL1 BCTL1 BCTL3 CCTL1 CCTL3 CMDC3 CTL1	7 3 4 24 31	2 2 2	1	1		9 5 4 28 39 1
	ACTL1 BCTL1 BCTL3 CCTL1 CCTL3 CMDC3	7 3 4 24 31 1	2 2 2	1 1 7	1		9 5 4 28 39 1 7
	ACTL1 BCTL1 BCTL3 CCTL1 CCTL3 CMDC3 CTL1 CTL3	7 3 4 24 31 1 2	2 2 2 5	1 1 7 8	1	1	9 5 4 28 39 1 7 10
	ACTL1 BCTL1 BCTL3 CCTL1 CCTL3 CMDC3 CTL1 CTL3 DCTL1	7 3 4 24 31 1 2 2 23	2 2 2 5 	1 1 1 7 8 4	1 1 1 2	1 2	9 5 4 28 39 1 7 10 35
	ACTL1 BCTL1 BCTL3 CCTL1 CCTL3 CMDC3 CTL1 CTL3 DCTL1 DCTL1 DCTL3	7 3 4 24 31 1 2 2 23 20	2 2 2 5 	1 1 7 8 4 0	1 1 2 3	1 1 2 0	9 5 4 28 39 1 7 10 35 26
0 1 2 3 km 3 km SOSSALIFE SAVE OUR SOIL FOR LIFE	ACTL1 BCTL1 BCTL3 CCTL1 CCTL3 CMDC3 CTL1 CTL3 DCTL1 DCTL1 DCTL3 DMDC3	7 3 4 24 31 1 2 2 23 20	2 2 2 5 	1 1 7 8 4 0	1 1 2 3	1 1 2 0	9 5 4 28 39 1 7 10 35 26 3
	ACTL1 BCTL1 BCTL3 CCTL1 CCTL3 CMDC3 CTL1 CTL3 DCTL1 DCTL1 DCTL3 DMDC3 ECTL3	7 3 4 24 31 1 2 2 23 20	2 2 2 5 	1 1 7 8 4 0 1	1 1 2 3	1 1 2 0	9 5 4 28 39 1 7 10 35 26 3 2

ESs in urban areas

BCTL1, public green area, about 10000 mq

- c.a. 74 Mg of C = 271.13 T CO₂
- c.a. 8000 m³ of water infiltration
- c.a. 1500 m³ of available water for plants and ET
- recreational value





Thanks for your attention!

<u>www.sos4life.it/en/</u> <u>www.facebook.com/saveoursoilforlife/</u>

