ECOPLAN Scenario-Evaluator (ECOPLAN-SE)

An integrated, region-specific GIS-tool to evaluate the impact of land-use changes on ecosystem services

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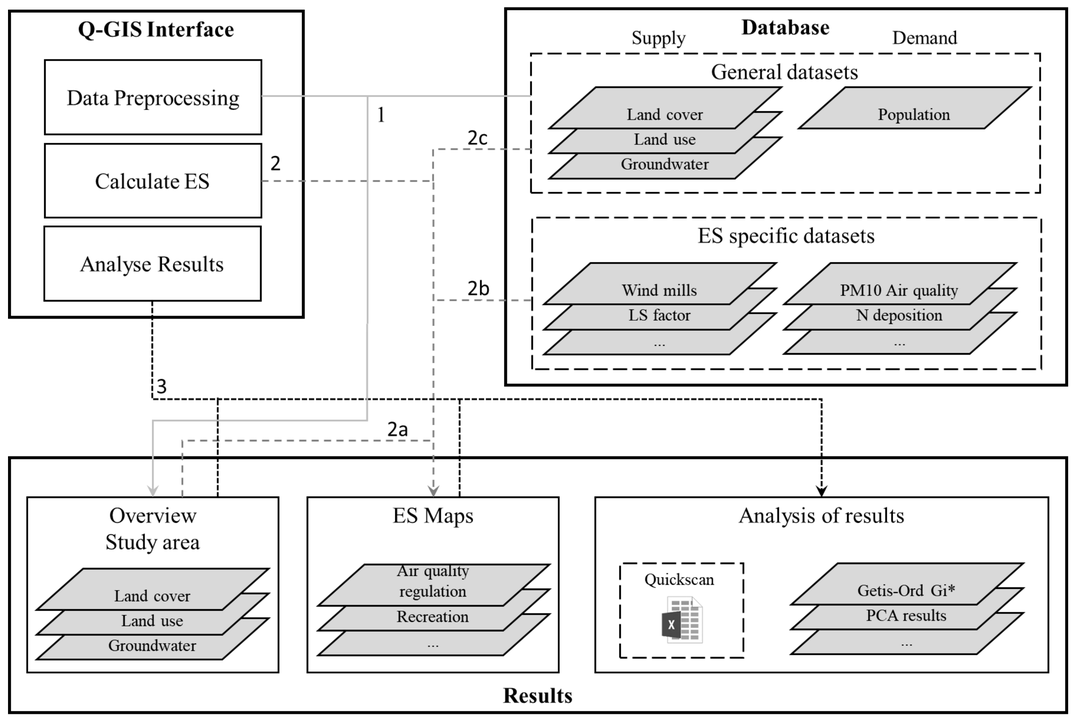
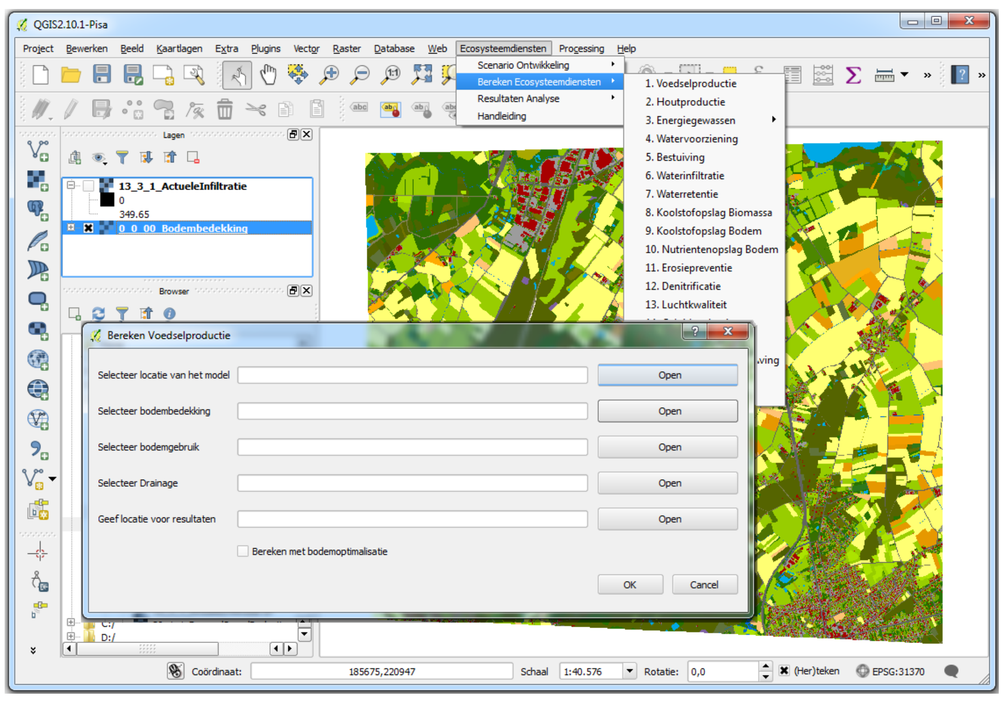
ECOPLAN-SE is a QGIS plugin for evaluating ecosystem services supply. It is able to calculate and evaluate quantitatively the effects of spatial scenarios on 18 different ecosystem services: 4 producing, 8 regulating, 3 supporting and 3 cultural services. The user can define and then evaluate spatial explicit scenarios using quantitative models. The tool presents the results of the calculations in several, understandable ways.

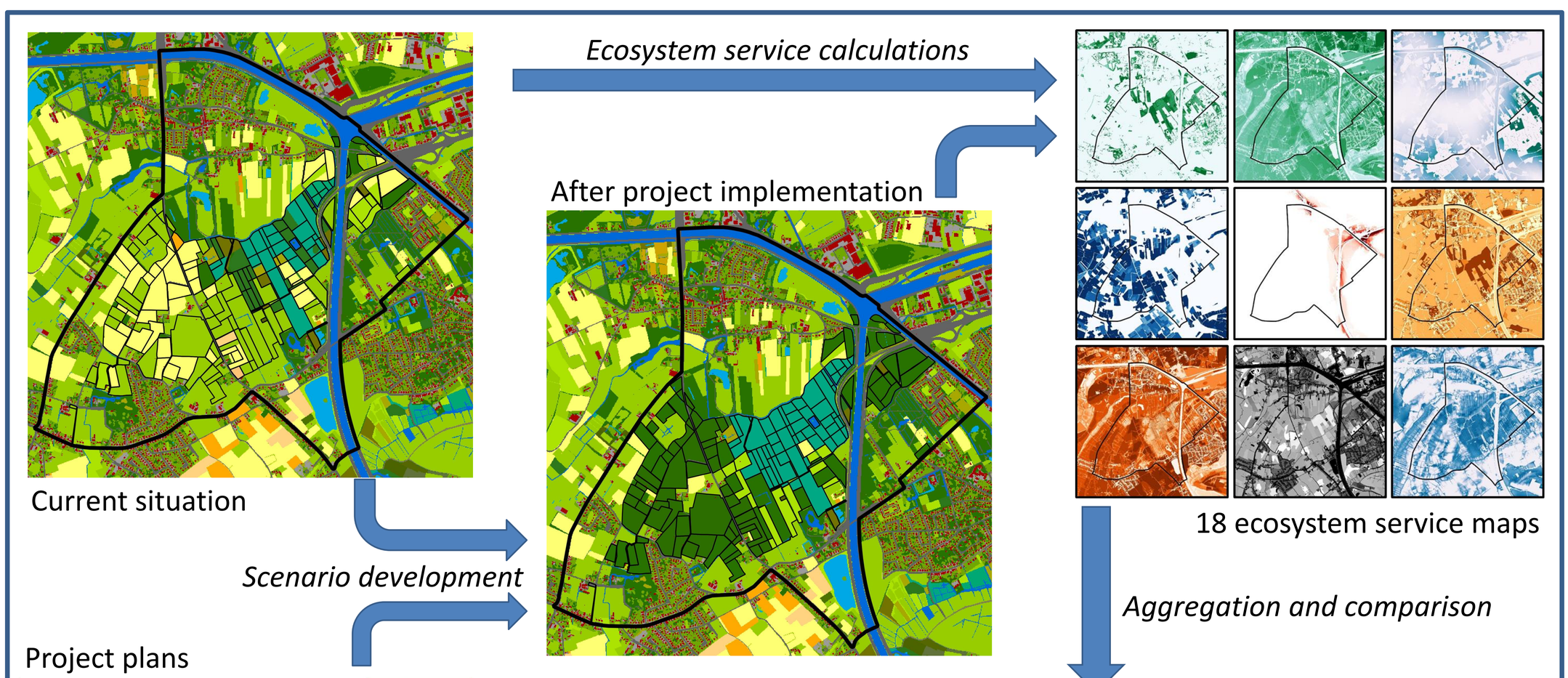
The tool is tailored to the context of Flanders (Belgium), incorporating ecosystem services relevant to policy makers and managers and making use of local data and knowledge. By providing an easy-to-use tool, including the required spatial database, time investments and learning curve are limited, increasing its applicability.

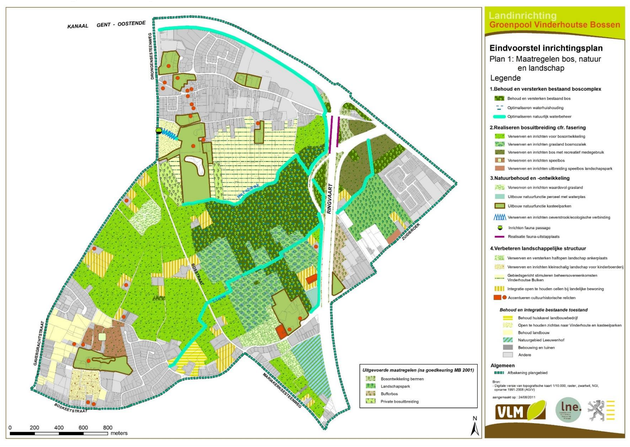


General overview of the various data processing stages and functionalities that the ECOPLAN-SE features.

1) During data preprocessing, data from the general database are extracted at study area level. Datasets can be adjusted to develop LC and LU scenarios using available modules.
2) 2) Ecosystem services are calculated using the data on (a) study area level. (b) Additional, ES specific data can be incorporated from the database when needed including both demand and supply related files. (c) When flows are taken into account, the plug-in will automatically increase the area that is evaluated to also include the relevant areas outside of the study area.
3) 3) ES maps are processed to obtain comprehensible, aggregated results in tables and hot-spot and bundle maps.







To make results insightful at the site level, the ECOPLAN-SE allows to compare different scenarios current and future land use The results are derived from the maps with quantitative and monetary valuation of ecosystem services for specific areas of interest (polygons).

		Quantification		Monetization (1000 €/year)		€ / ha non-urban area by year	
	Ecosystem function/service	Unit		Low estimate	High estimate	Low estimate	High estimate
Producing	Food production	177.86	k€ added value by year	177.86		326.93	
	Wood production	593.28	m³ harvested wood	25.87		47.55	
	Energy crops - agriculture	-	Gj Low Heat value	0		0.00	0.00
	Energy crops - forestry	-	Gj Low Heat value	no data available			
	Energy crops - nature management	-	Gj Low Heat value	no data available			
	Water provisioning	141.05	1000 m³ water	10.58	28.21	19.44	51.85
Supporting and regulating	Pollination	0.01	Mean indicatorvalue by ha	supporting function			
	Water infiltration	1284.72	1000 m³ infiltration capacity	supporting function			
	Water retention	1122.22	1000 m³ waterretention capacity	supporting function			
	Carbon in biomass	465.46	ton C opslag biomass by year	102.40		188.22	
	Carbon in soil	94560.66	ton C stock	208.03		382.38	
	Nitrogen in soil	5713.09	ton N stock	supporting function			
	Phosphorus in soil	380.87	ton P stock	supporting function			
	Nitrogen removal	343.58	kg N removal	1.72	25.42	3.16	46.73
	Erosion prevention	1435.06	ton soil	no data available			
	Air quality regulation	6.56	ton PM removed	354.00		651.00	
	Noise attenuation	112.00	number of houses	21.00	123.00	39.00	227.00
	Cooling effects from green infrastructure	0.00	decrease °C / ha non-urban	no data available			
Cultural	Recreation	46.00	1000 visitors each year	139.23	417.69	440.19	1320.57
	Added value to houses due to a green environment	3.04	1000 inhabitants within 100m	31.89		58.62	
	Health effects of nature	11.55	1000 inhabitants within 1km	6914.72		12709.77	
			Total value	7956.09	8377.76	14808.17	15951.76