

Table 3 Description of the Data for the Scenarios

BAU: Business as usual

CC_EU: Agricultural management scenario of introducing a non-N-fixing cover crop (grass) (CC)

CC_nfix_EU : Agricultural management scenario of introducing a N-fixing cover crop (vetch as 'green manure')

lowPmin_EU : Agricultural management scenario reduced mineral P fertilization

lowPorg_EU: Agricultural management scenario reduced organic P fertilization

ID	Name	Description	Unit	Timeframe	Figure in manuscript
1	./Projection/BAU_EU.tif	Multiband tiff including 30 raster layers relevant for the projected business as usual (BAU) P budget and P soil pools of the EU and UK. Each layer is described in Table 2.	See Table 4	2020-2029 & 2040-2049 & 2027-2032	
2	./Projection/Bulk_density.tif	Bulk density derived from soil texture datasets based on the LUCAS topsoil data for ca 20,000 samples across EU with a resolution of 500m.	[t m ⁻³]	2015	
3	./Projection/CC_EU.tif	Multiband tiff including 30 raster layers relevant for the projected P budget and P soil pools of the EU and UK for the agricultural management scenario of introducing a non-N-fixing cover crop (grass) (CC). Each layer is described in Table 2.	See Table 4	2020-2029 & 2040-2049 & 2027-2032	
4	./Projection/CC_nfix_EU.tif	Multiband tiff including 30 raster layers relevant for the projected P budget and P soil pools of the EU and UK for the agricultural management scenario of introducing a N-fixing cover crop (vetch as 'green manure') (CC_nfix).	See Table 4	2020-2029 & 2040-2049 & 2027-2032	
5	./Projection/lowPmin_EU.tif	Multiband tiff including 30 raster layers relevant for the projected P budget and P soil pools of the EU and UK for the agricultural management scenario	See Table 4	2020-2029 & 2040-2049 & 2027-2032	

		reduced mineral P fertilization (lowPmin). Each layer is described in Table 2.			
6	./Projection/lowPorg_EU.tif	Multiband tiff including 30 raster layers relevant for the projected P budget and P soil pools of the EU and UK for the agricultural management scenario reduced organic P fertilization (lowPorg). Each layer is described in Table 2.	See Table 4	2020-2029 & 2040-2049 & 2027-2032	

Table 4: description of the multiband tiffs for the agricultural management scenarios BAU_EU.tif; CC_EU.tif; CC_nfix_EU.tif; lowPmin_EU.tif; lowPorg_EU.tif.

ID/Layer	Description	Unit	Timeframe
1	Average mineral P input	[kg ha ⁻¹ year ⁻¹]	2020-2029
2	Average organic P input	[kg ha ⁻¹ year ⁻¹]	2020-2029
3	Average P export via grain harvest	[kg ha ⁻¹ year ⁻¹]	2020-2029
4	Average P export via crop residue removed during harvest	[kg ha ⁻¹ year ⁻¹]	2020-2029
5	Average P export via crop residue removed during most recent harvest event*	[kg ha ⁻¹ year ⁻¹]	2020-2029
6	Average P leached from the soil organic layer into stream flow	[kg ha ⁻¹ year ⁻¹]	2020-2029
7	Average labile phosphate pool (in resin extractable P)	[g m ⁻²]	2020-2029
8	Average soil C lost by soil erosion	[t ha ⁻¹ year ⁻¹]	2020-2029
9	Average soil organic carbon pool	[g m ⁻²]	2020-2029
10	Average total P pool	[g m ⁻²]	2020-2029
11	Average mineral P input	[kg ha ⁻¹ year ⁻¹]	2040-2049

12	Average organic P input	[kg ha ⁻¹ year ⁻¹]	2040-2049
13	Average P export via grain harvest	[kg ha ⁻¹ year ⁻¹]	2040-2049
14	Average P export via crop residue removed during harvest	[kg ha ⁻¹ year ⁻¹]	2040-2049
15	Average P export via crop residue removed during most recent harvest event*	[kg ha ⁻¹ year ⁻¹]	2040-2049
16	Average P leached from the soil organic layer into stream flow	[kg ha ⁻¹ year ⁻¹]	2040-2049
17	Average labile phosphate pool (in resin extractable P)	[g m ⁻²]	2040-2049
18	Average soil C lost by soil erosion	[t ha ⁻¹ year ⁻¹]	2040-2049
19	Average soil organic carbon pool	[g m ²] year ⁻¹	2040-2049
20	Average total P pool	[g m ²] year ⁻¹	2040-2049
21	Average mineral P input	[kg ha ⁻¹ year ⁻¹]	2027-2032
22	Average organic P input	[kg ha ⁻¹ year ⁻¹]	2027-2032
23	Average P export via grain harvest	[kg ha ⁻¹ year ⁻¹]	2027-2032
24	Average P export via crop residue removed during harvest	[kg ha ⁻¹ year ⁻¹]	2027-2032
25	Average P export via crop residue removed during most recent harvest event*	[kg ha ⁻¹ year ⁻¹]	2027-2032
26	Average P leached from the soil organic layer into stream flow	[kg ha ⁻¹ year ⁻¹]	2027-2032
27	Average labile phosphate pool (in resin extractable P)	[g m ⁻²]	2027-2032
28	Average soil C lost by soil erosion	[t ha ⁻¹ year ⁻¹]	2027-2032
29	Average soil organic carbon pool	[g m ⁻²]	2027-2032
30	Average total P pool	[g m ⁻²]	2027-2032