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RESEARCH INSTITUUT VOOR DE GROENE RUIMTE

Prediction of soil abiotics from species composition

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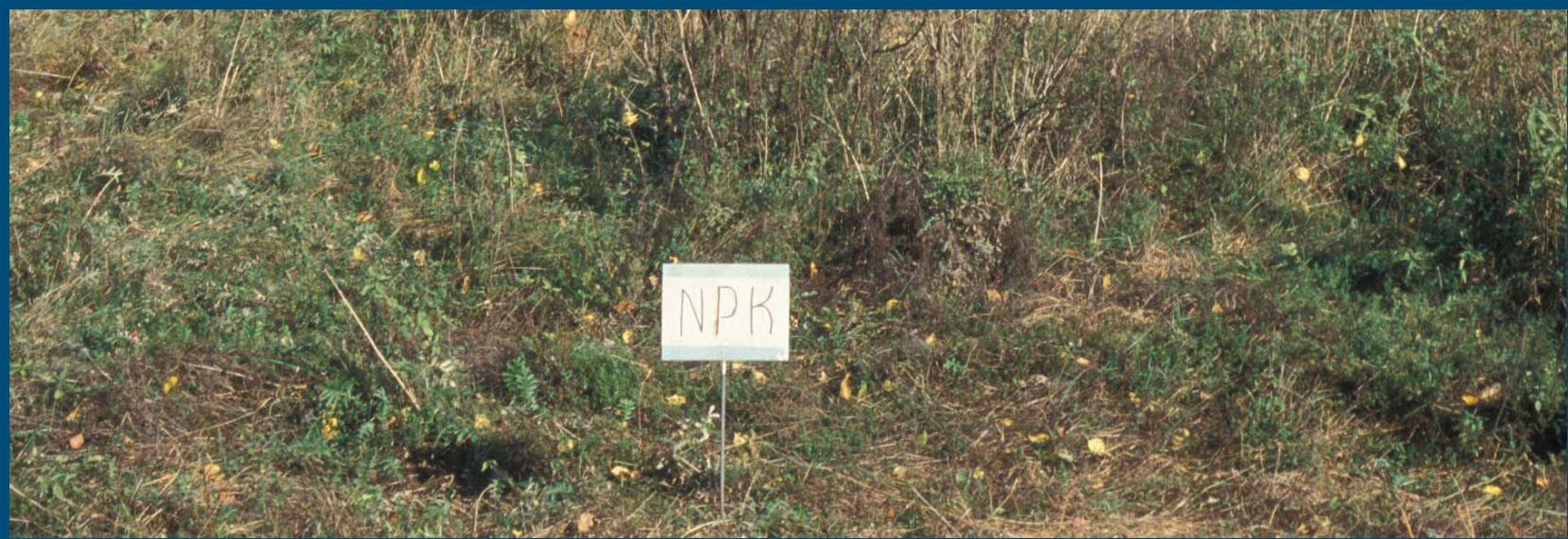
Method

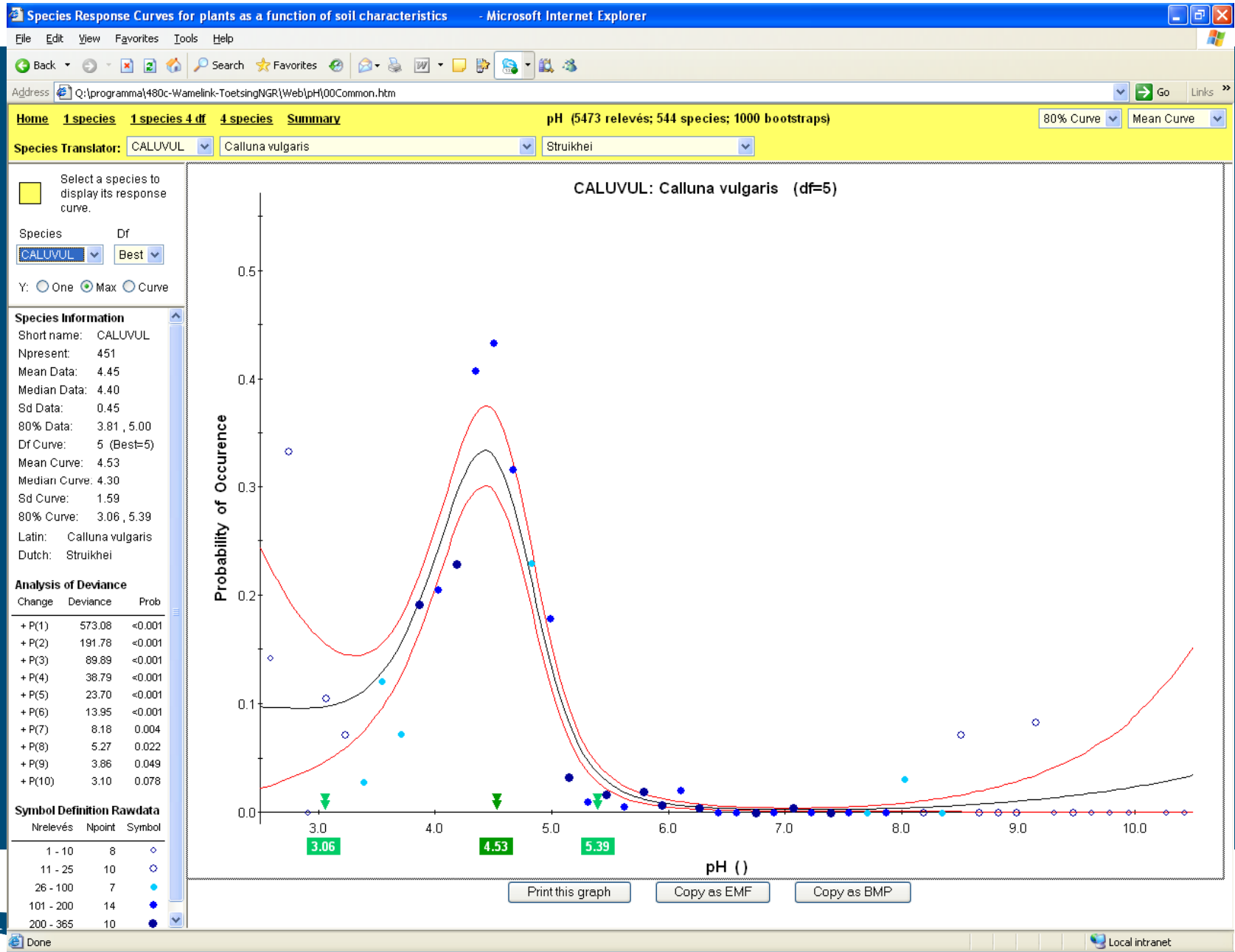
1 Fill a database with vegetation relevés and measured soil pH

2 Estimate the response per species

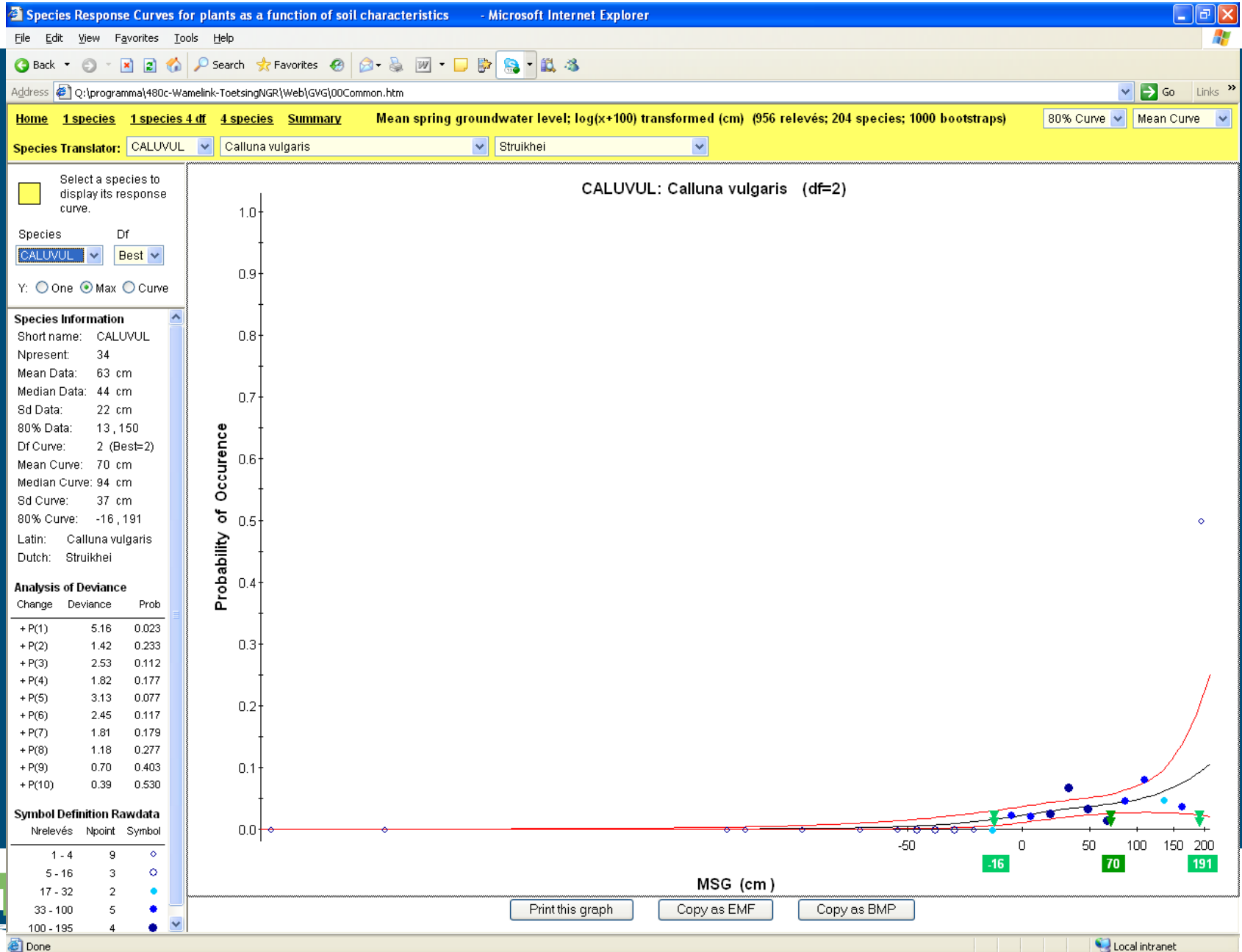
3 Use the responses per species to estimate the pH for a new relevée



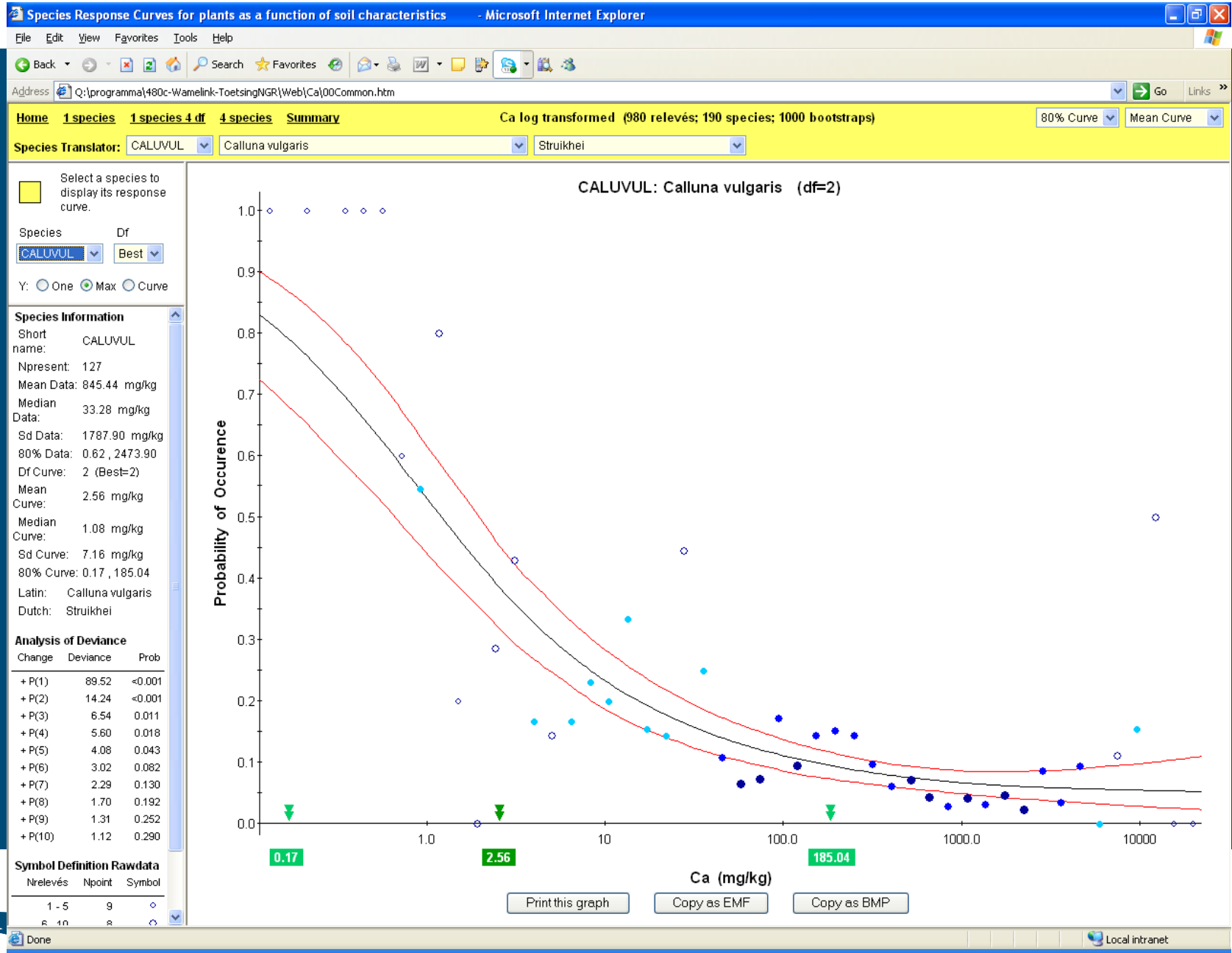
Response curves (splines) *Calluna vulgaris* (pH)



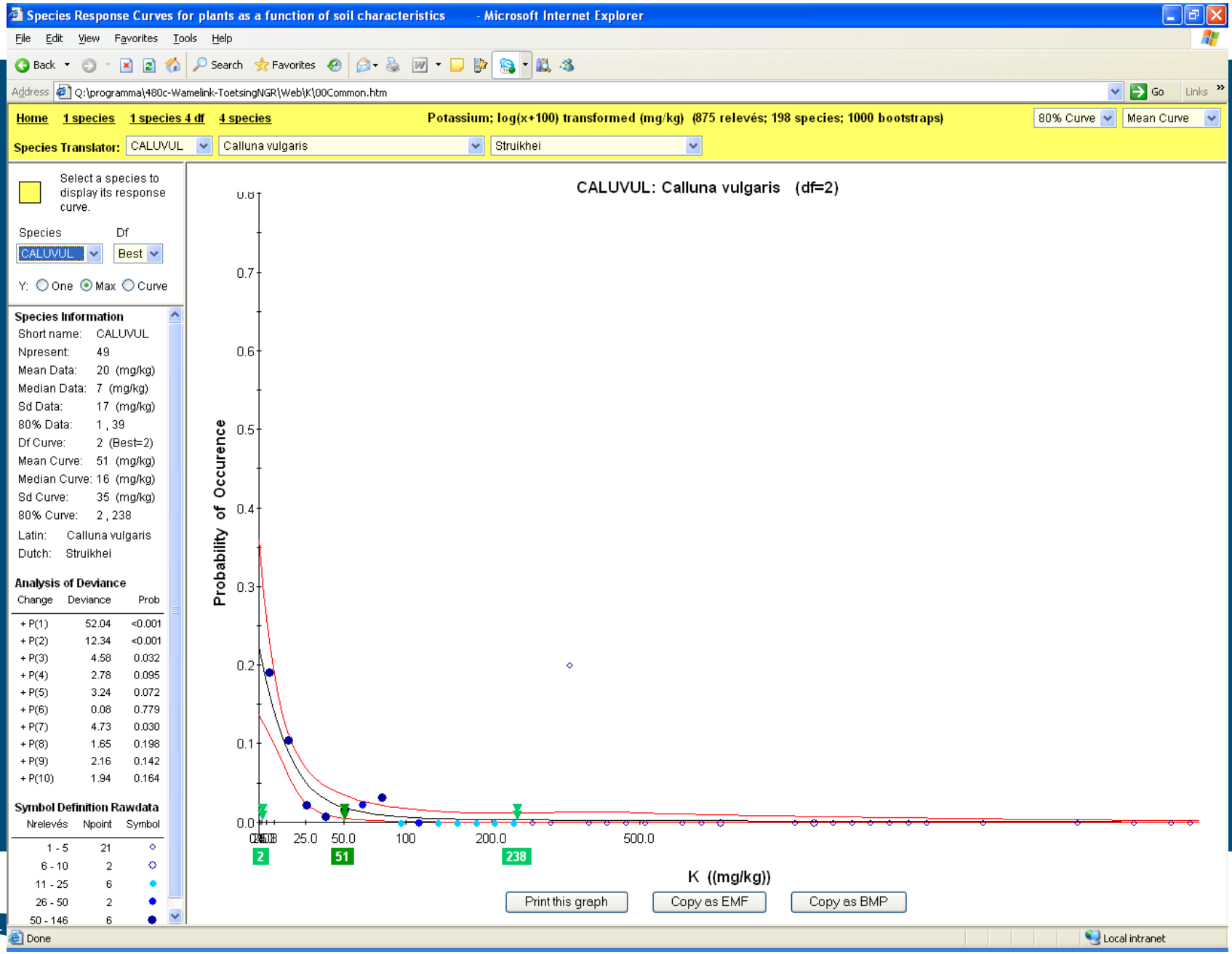
Response curves (splines) *Calluna vulgaris* (mean spring groundwater table)



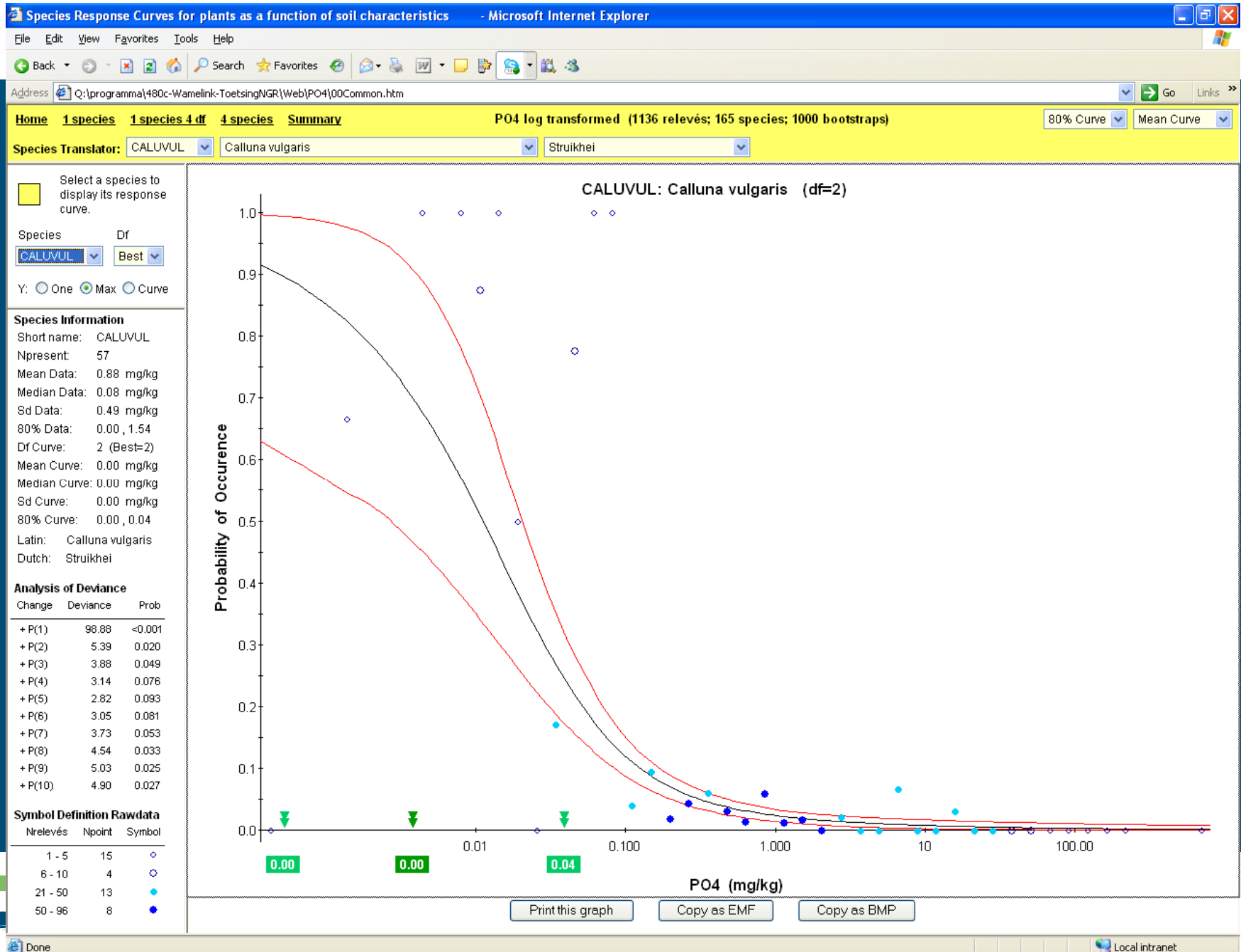
Response curves (splines) *Calluna vulgaris* (Ca)



Response curves (splines) *Calluna vulgaris* (K)



Response curves (splines) *Calluna vulgaris* (PO_4)



CD/website with results (Means)

LatinName	C_N	Ca	Cl	ghg	glg	gvg	K	Mg	Na	Ntot	nh4
	-	mg/g	mg/kg	cm	cm	cm	mg/kg	mg/kg	mg/kg	g/kg	mg/kg
Acer campestre				52.42	122.87	70.03					
Acer platanoides				61.70							
Acer pseudoplatanus				55.35	120.47	68.81					
Achillea millefolium	13.12	52.89	904.80	35.50	112.16		25.27	34.18	8.99	1.13	
Achillea ptarmica				19.17	80.67						
Adoxa moschatellina				30.97	92.34	43.46					
Aegopodium podagraria				47.11	107.24	67.56				1.70	
Agrimonia eupatoria							45.47		9.29		
Agrostis species	9.62			27.96	125.49		18.37				0.79
Agrostis canina	20.45	145.67	361.25	9.70	79.55	19.10	10.87	22.56	21.75	2.46	1.25
Agrostis capillaris	16.05	47.35	1516.06	43.87	105.18	47.39	21.01	33.00	9.97	1.40	1.23
Agrostis gigantea							40.66		9.26		
Agrostis stolonifera	17.88		1236.26	22.81	67.49	29.76	27.95		32.81	1.61	1.19

www.abiotic.wur.nl

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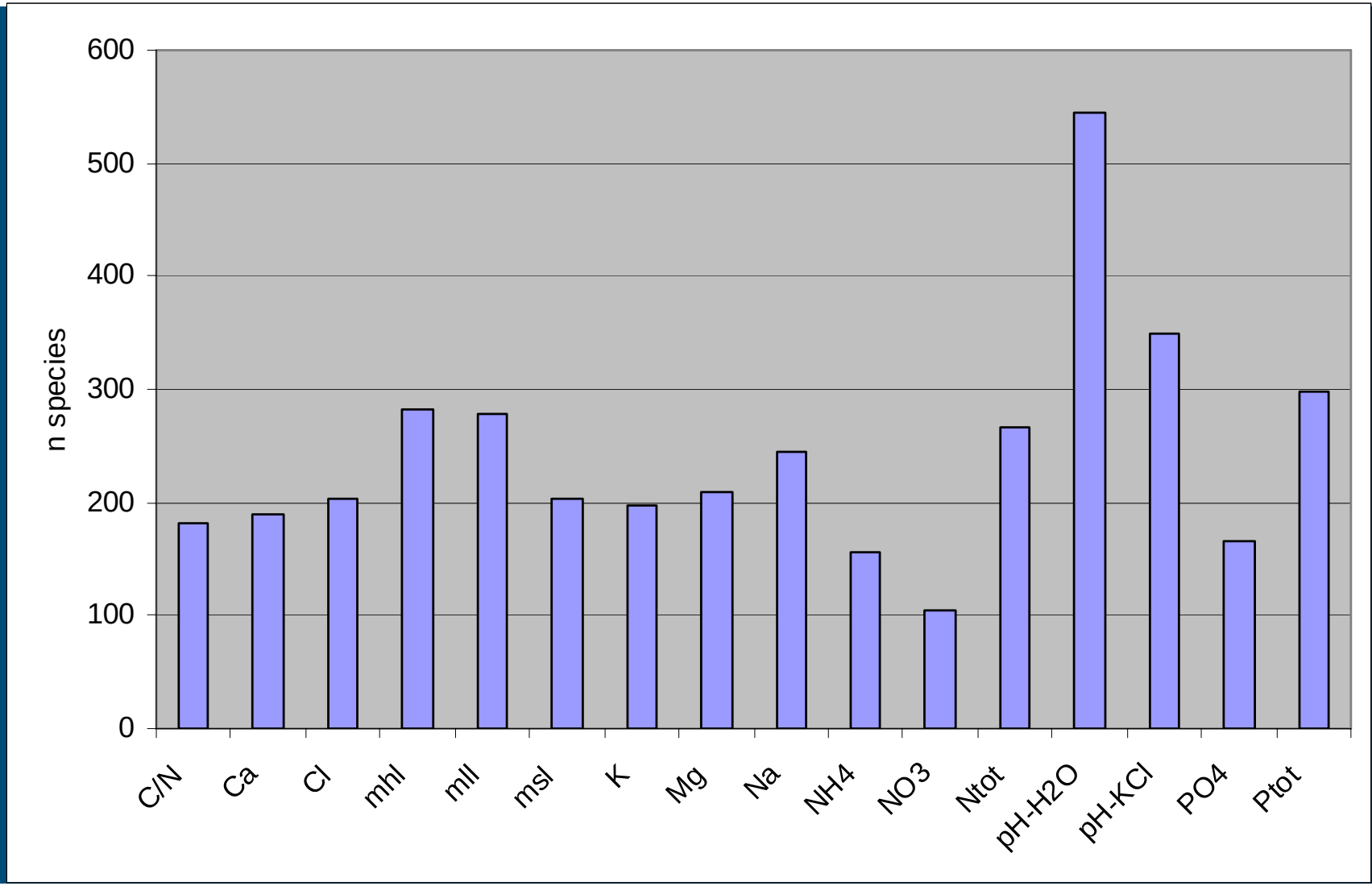
Wamelink, G.W.W, Goedhart, P.W., Dobben, H.F van & Berendse, F. 2005. Plant species as predictors of soil pH: replacing expert judgement by measurements. Journal of vegetation science 16:461-470.

Number of species responses per abiotic variable



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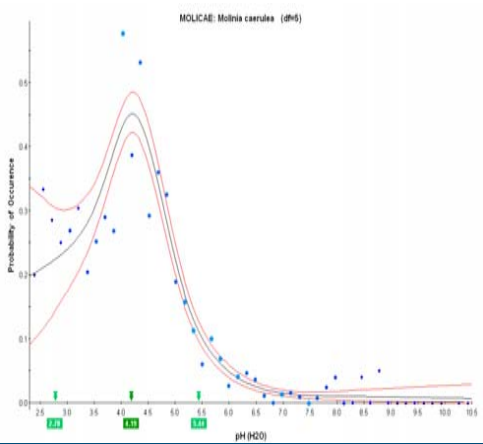
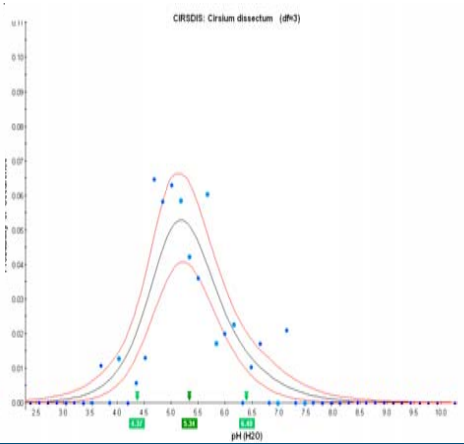
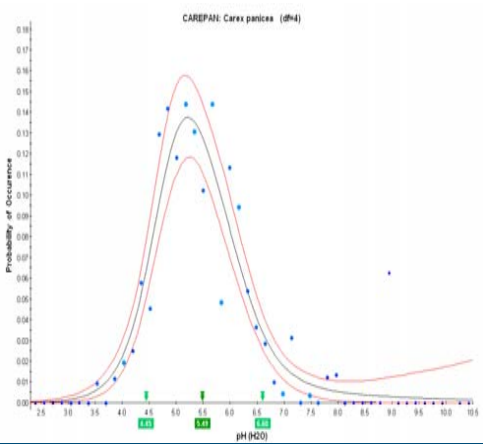
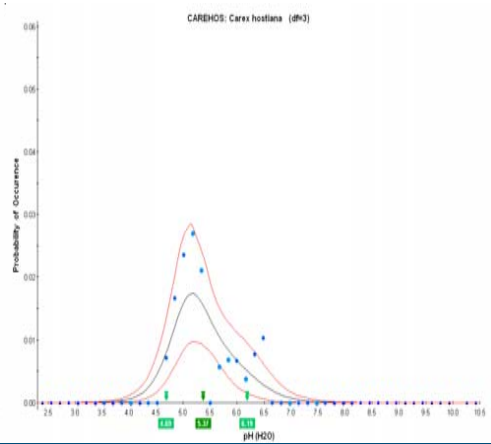
Re-estimation of the response curves









Mean per species

↓

Calculate average (pH) for relevés
160,000 relevés

↓

Re-estimate means etc. and the spline per species

Discussion

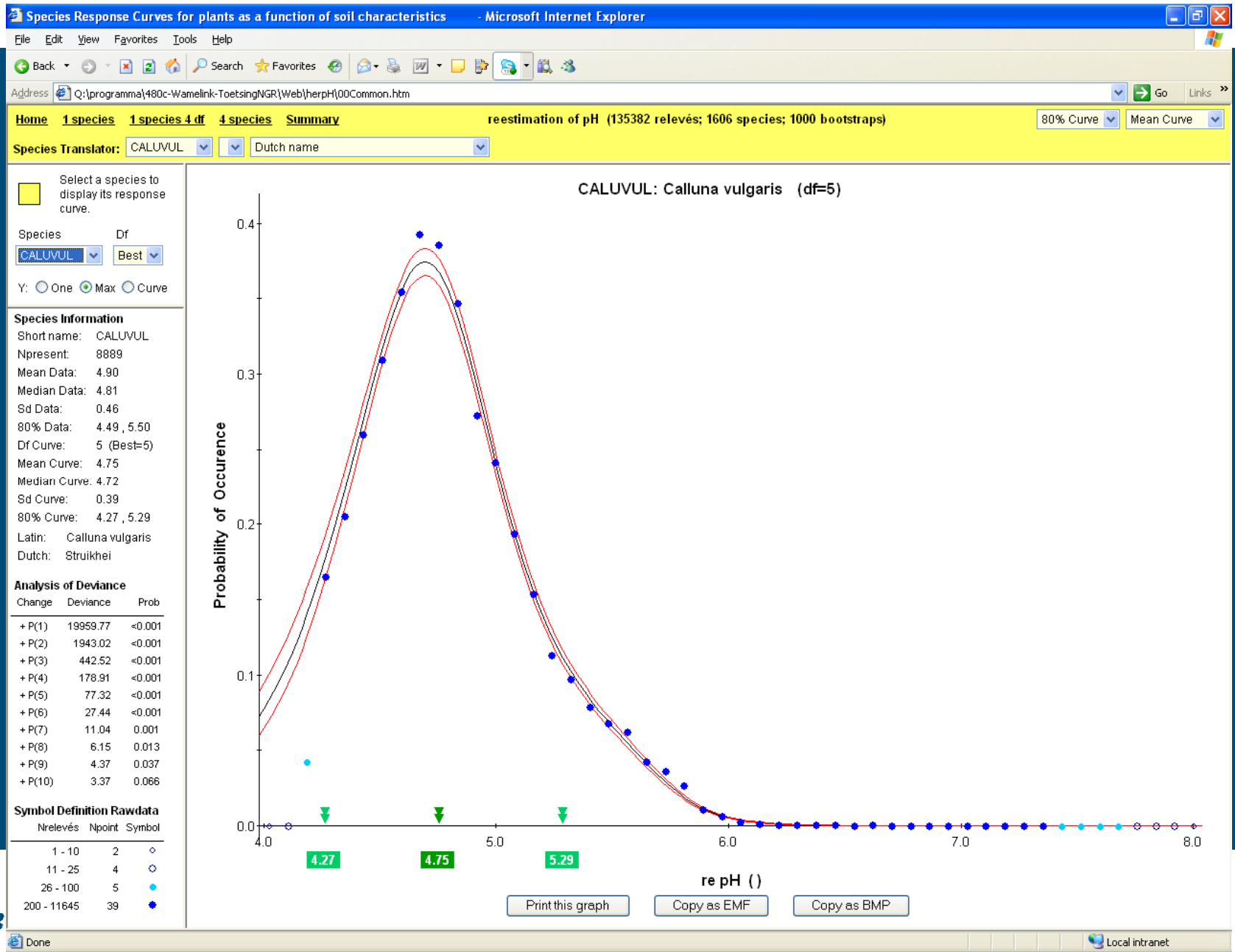
Advantages

- more data available
- more species responses
- Possibility to look at interaction?
- Higher accuracy??

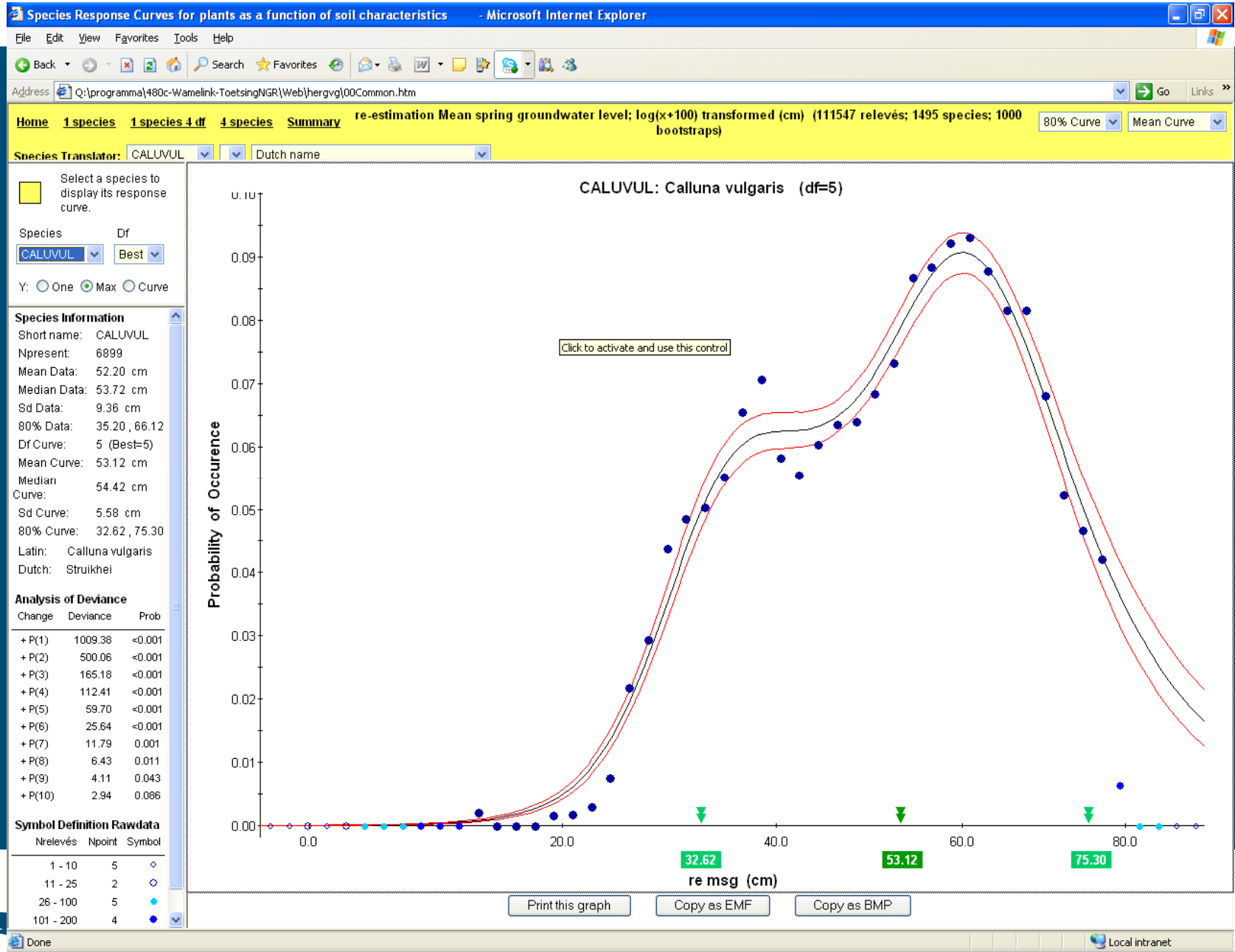
Disadvantages

- not based on direct measurements
- Regression to the mean, correction necessary
- Circularity
- Not totally independent

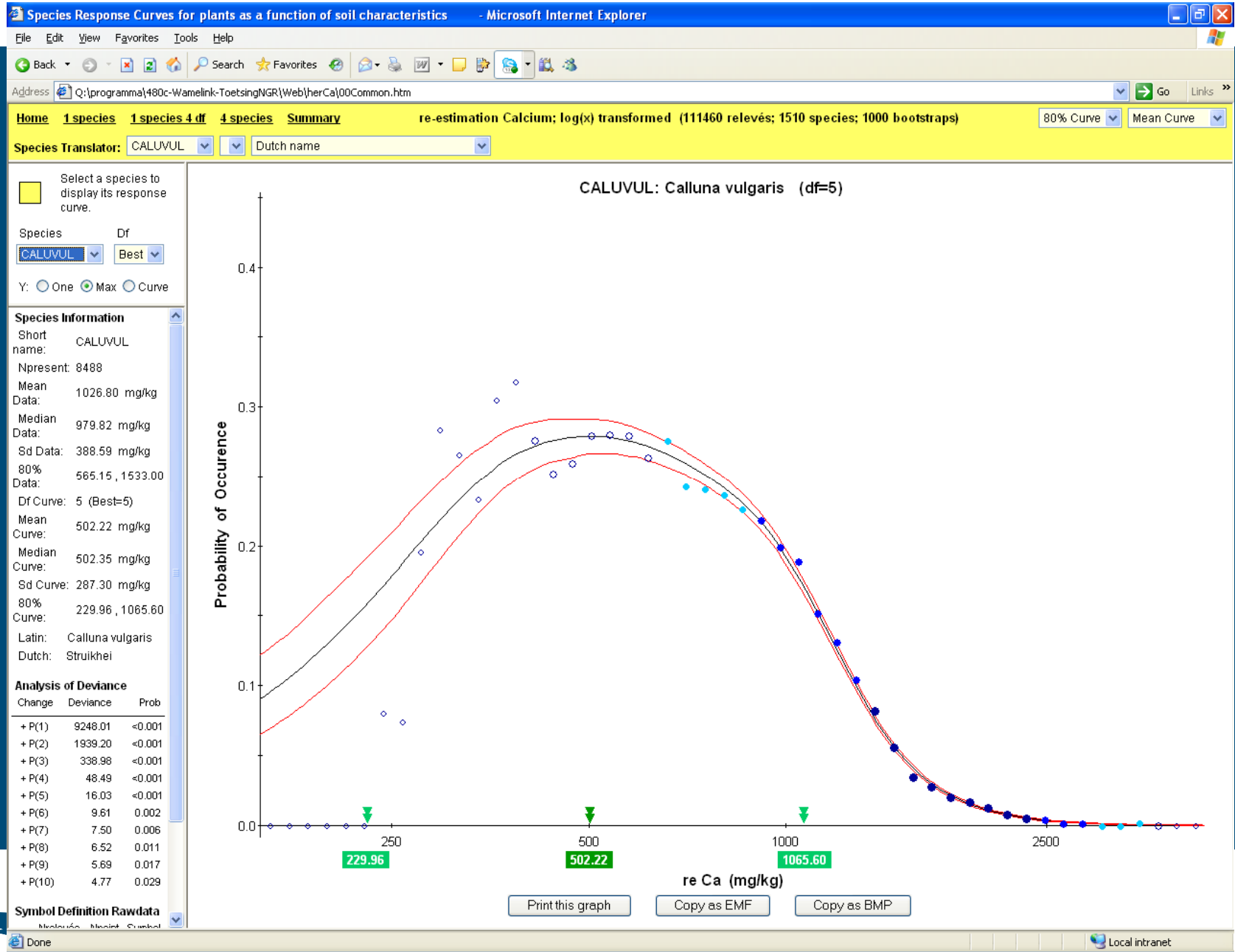
Response curves (splines) *Calluna vulgaris* (pH)



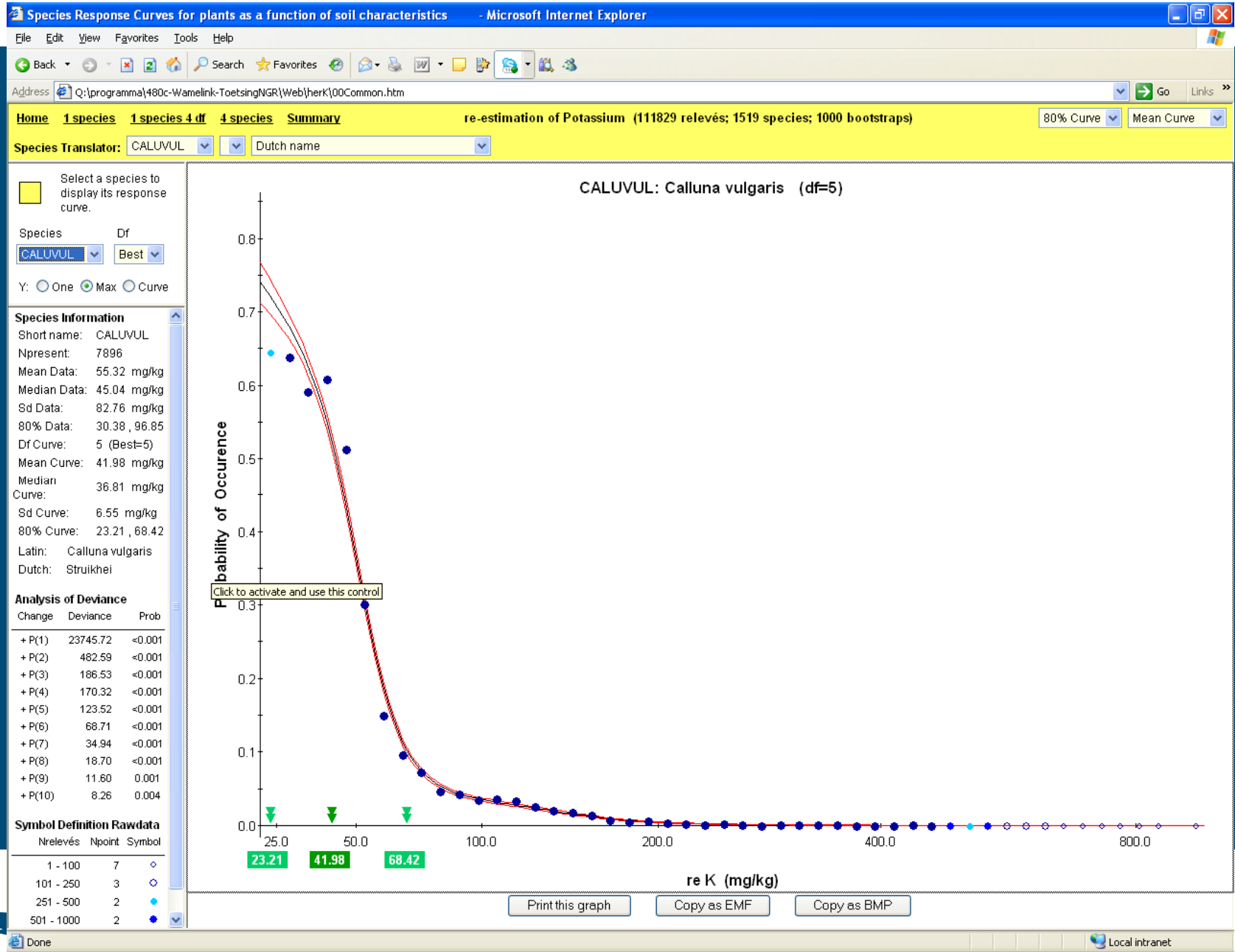
Re-estimated curves (splines) *Calluna vulgaris* (mean spring groundwater table)



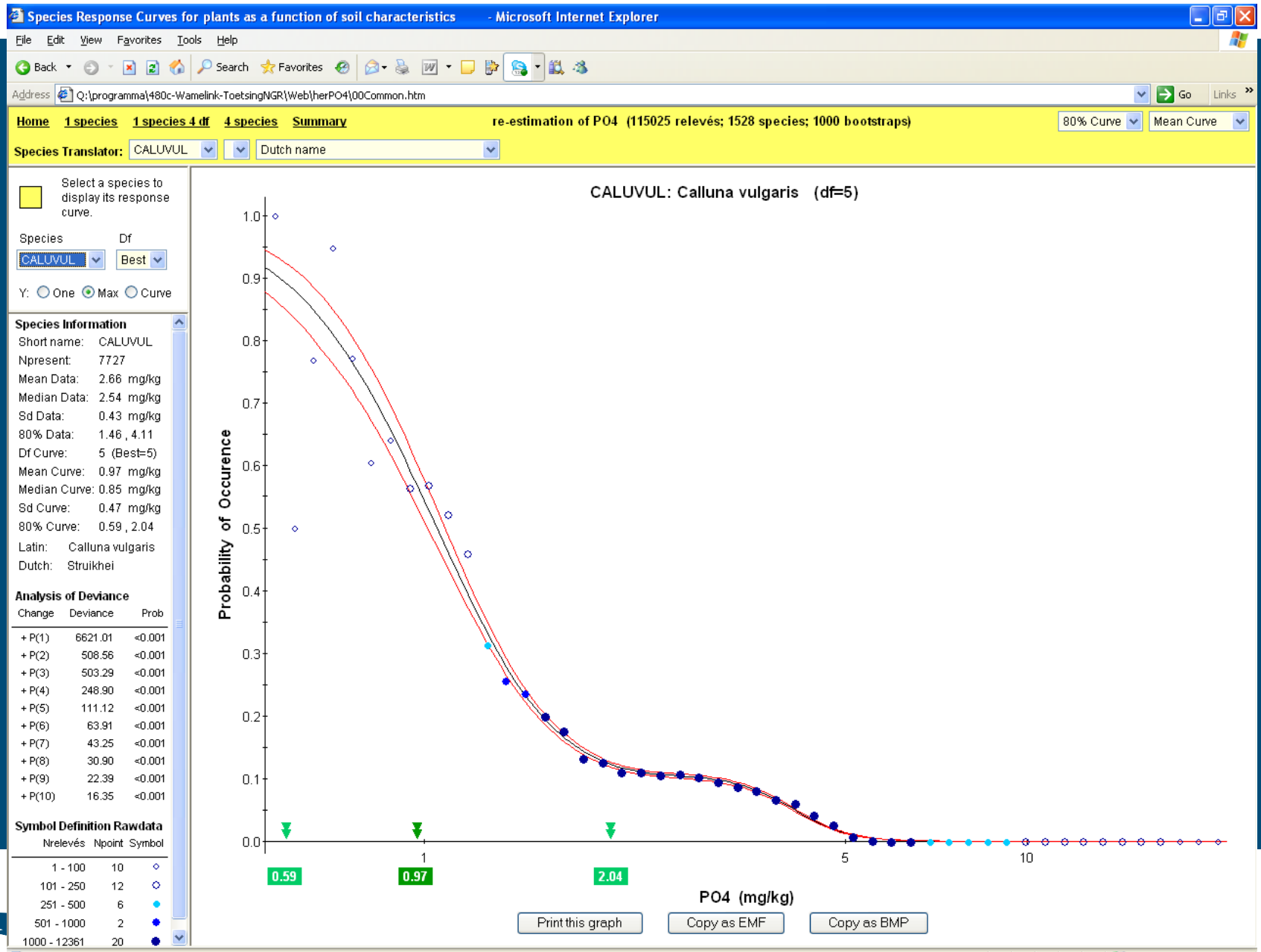
Re-estimated curves (splines) *Calluna vulgaris* (Ca)



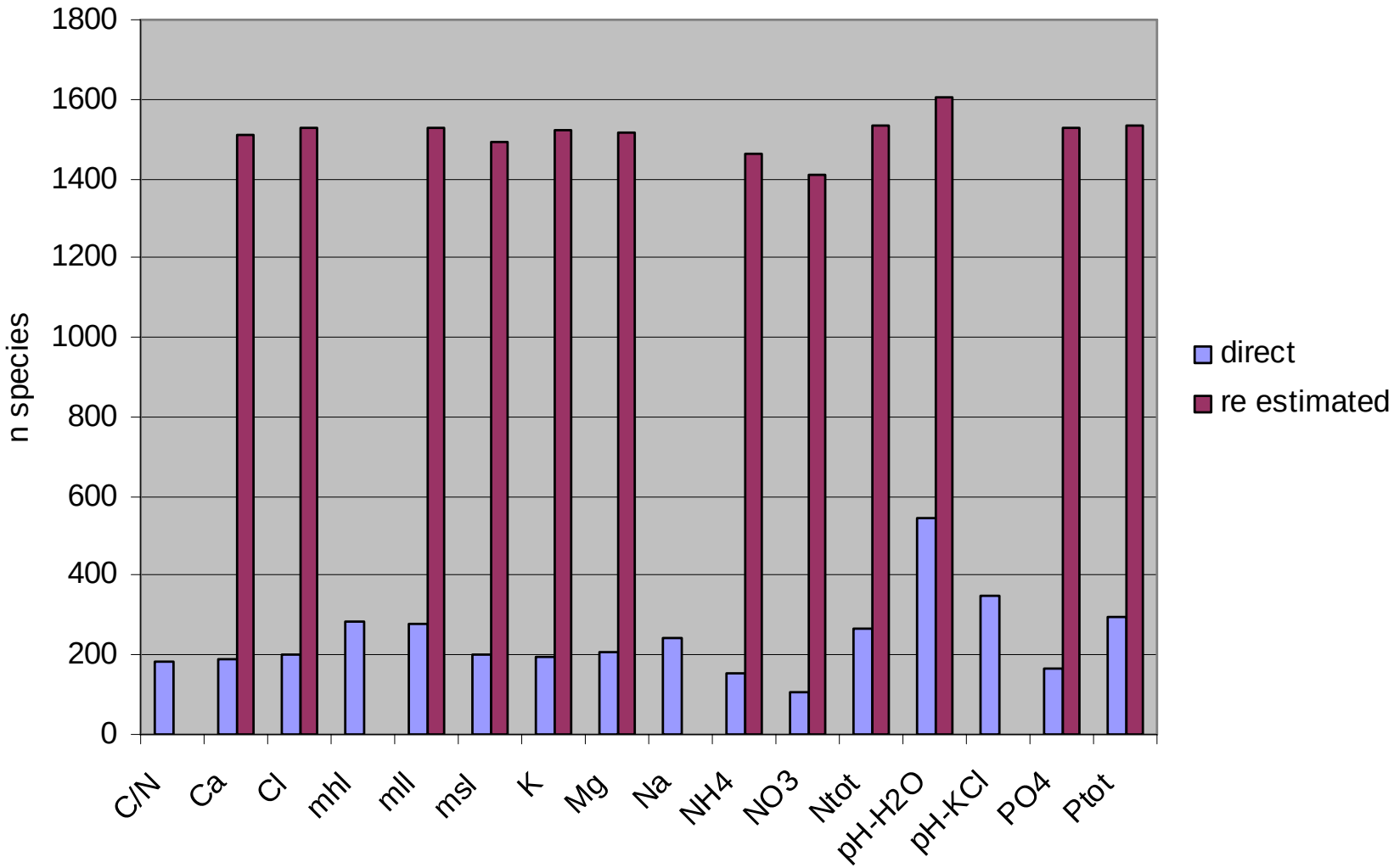
Re-estimated curves (splines) *Calluna vulgaris* (K)



Re-estimated curves (splines) *Calluna vulgaris* (PO_4)



Number of species responses per abiotic variable



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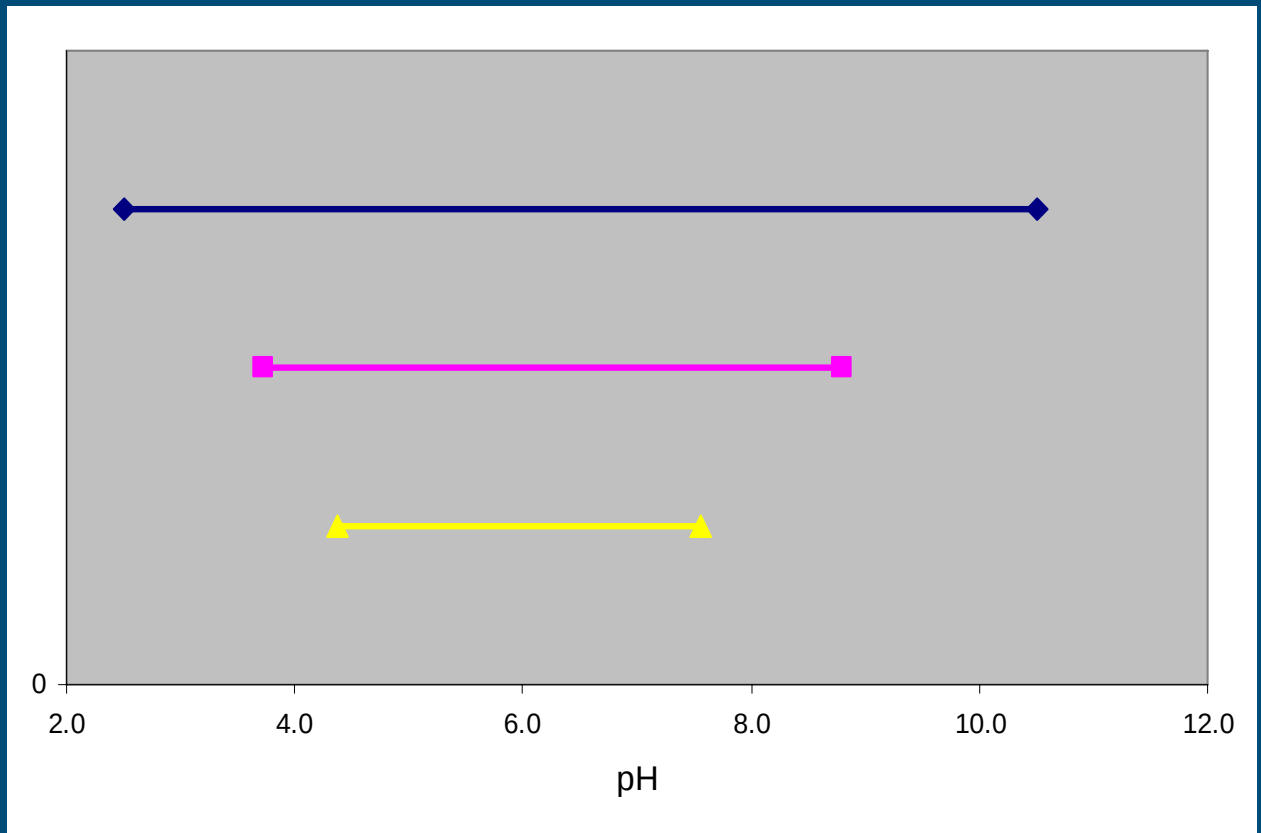
Correction for regression to mean



Original database

estimated means

Re-estimated means

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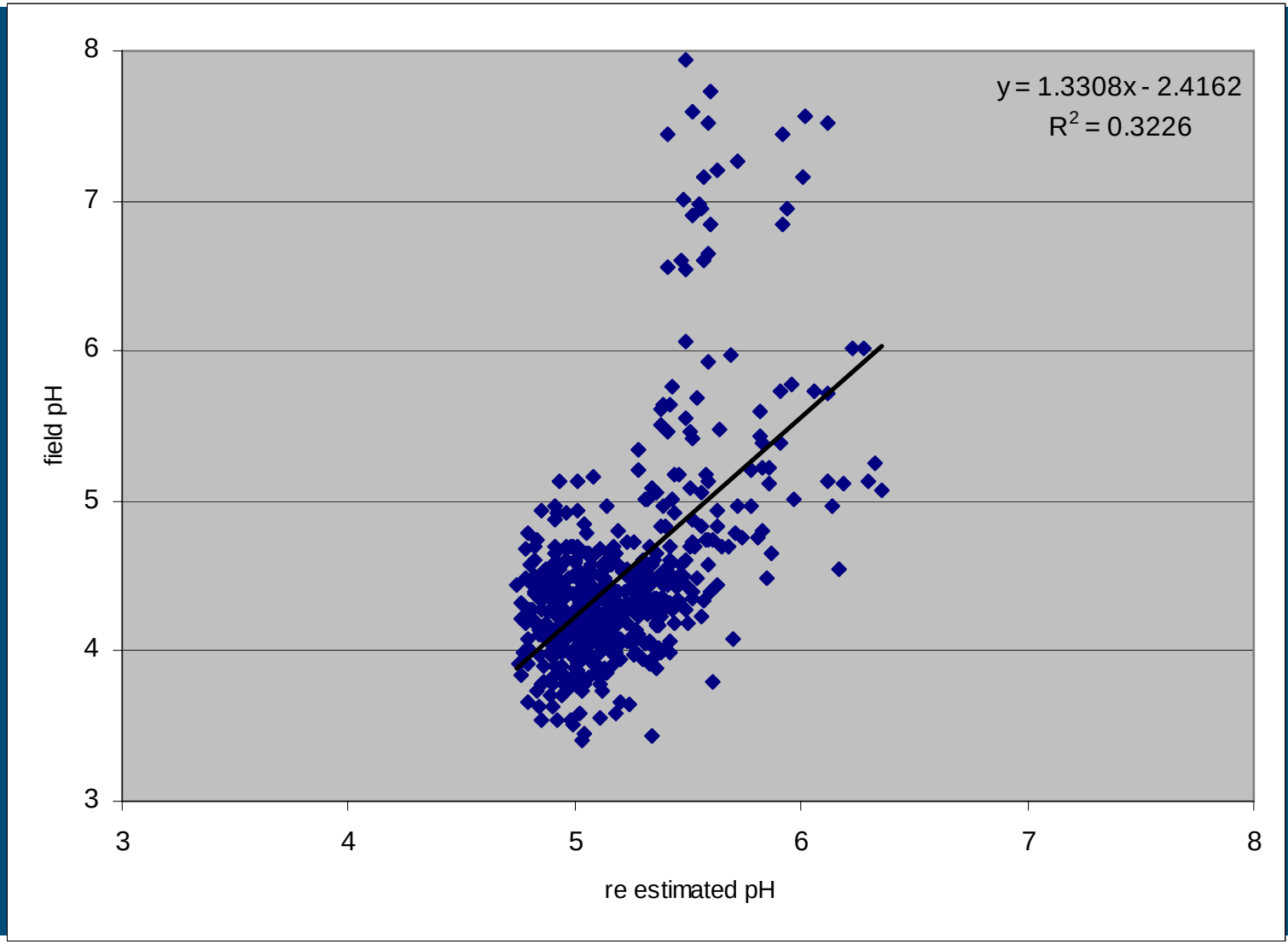
Correction for regression to mean



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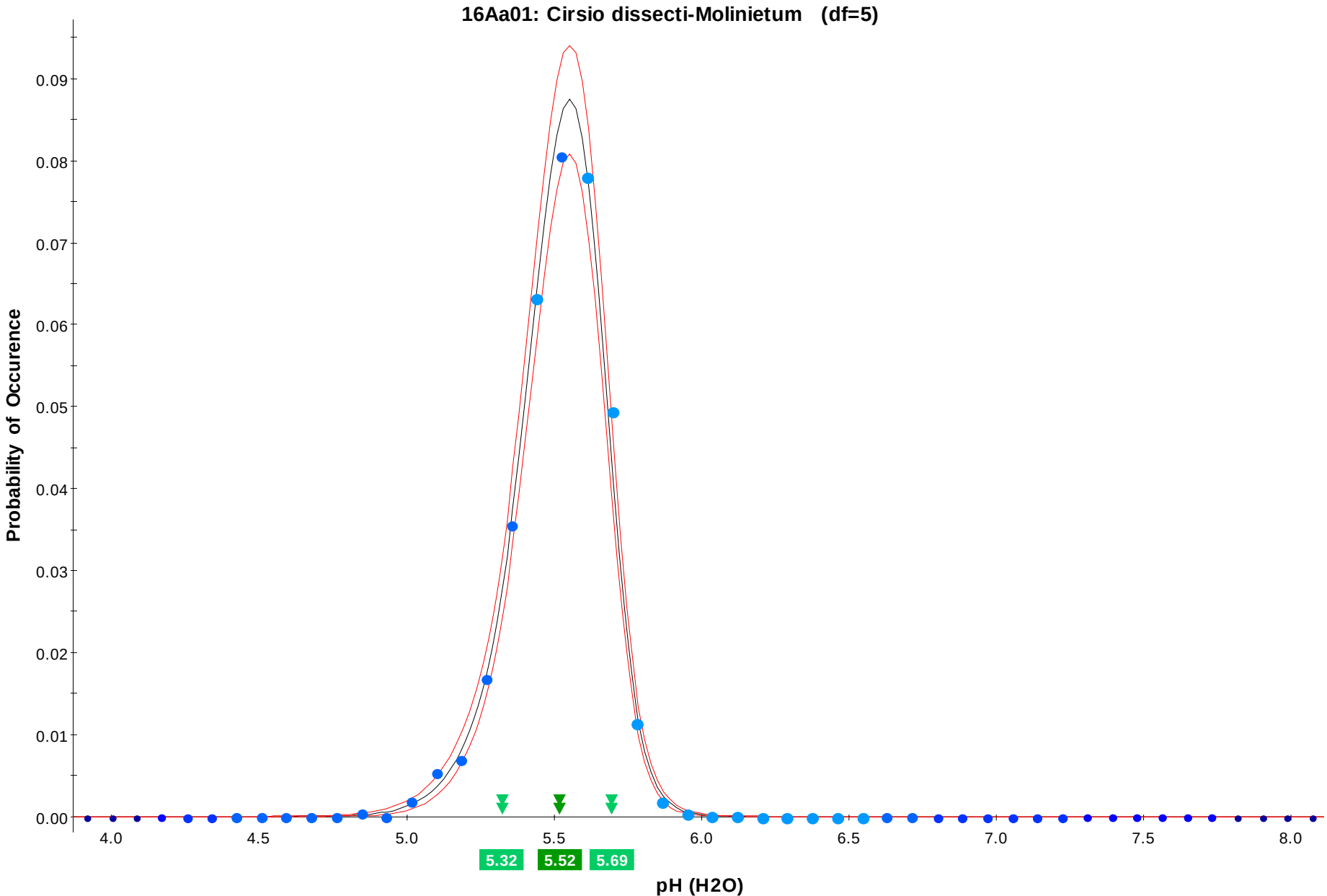
Test for pH

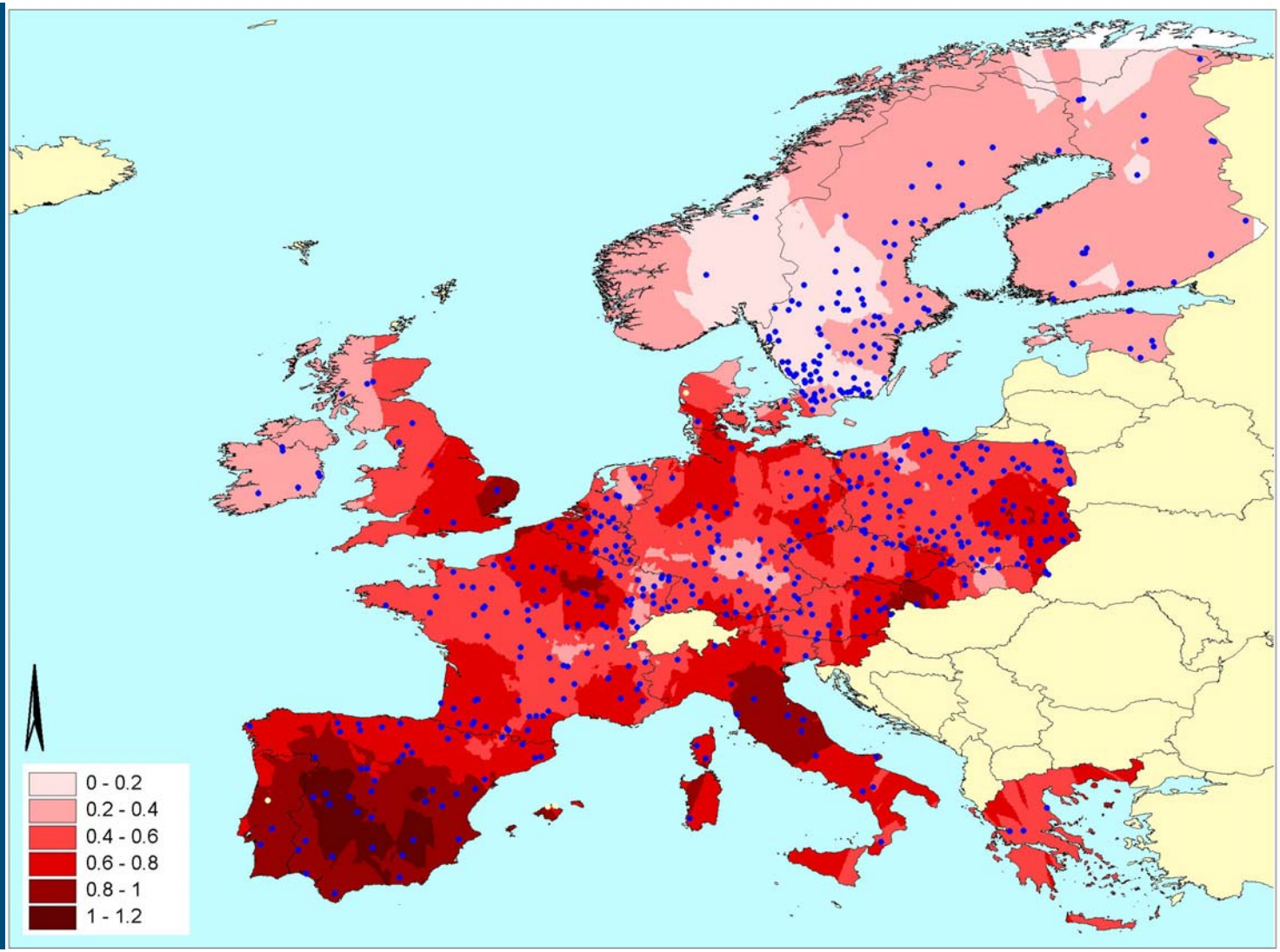
set	average diff. field-estimate
direct	0.53
direct corrected	0.38
re estimated	0.83
re estimated corrected	0.41


Thanks

Response of Cirsio dissecti-Molinietum for pH



Smoothed difference between measured and calculated soil pH for European forest (ICP forest level2 plots)



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