Cambridge Environmental Assessments

Can scale of use be used in aquatic risk assessments?

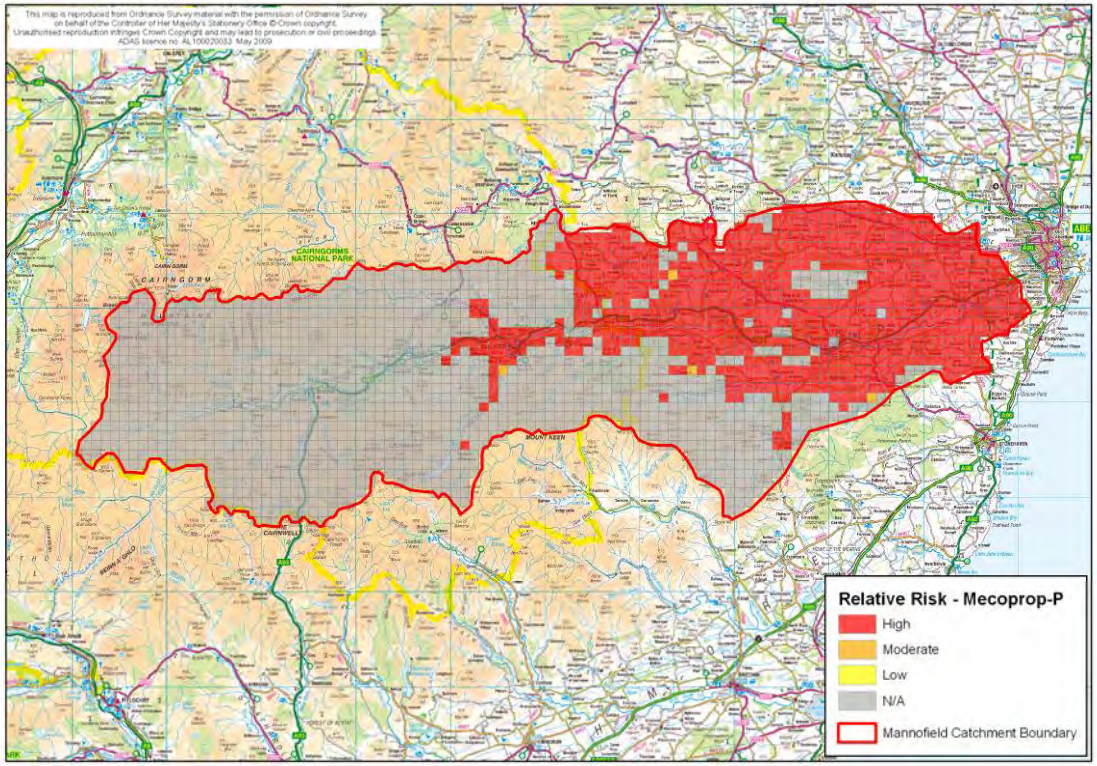
Contents

- Background
- Examples
  - Drinking Water Safety Plans (UK)
  - UK HT Drainflow
  - Groundwater RA (NL)
- Minor Uses Project
  - Approach
  - Timeframes

Background

- Can scale of use be used in aquatic risk assessments?
  - Is limited scale of use a mitigating factor when considering risk assessment results?
  - Does an existing approval for use of a product on an extensive crop/basis aid deliberations of safe use on a limited crop/basis?

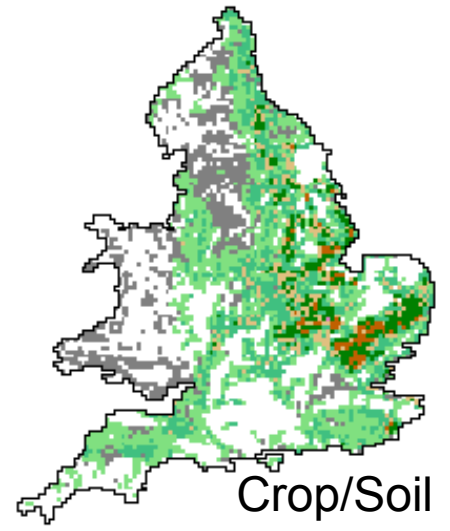
Example 1 – UK DWSP

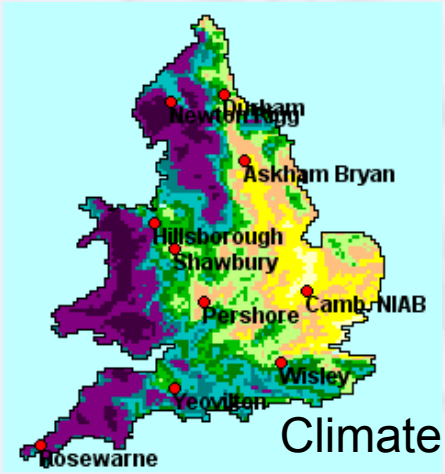


	Total Load Applied to Agriculture (kg)	5.672
	Total Load in Runoff (kg)	4.220E-02
	Concentration in Runoff	Low
Mecoprop-P	Total Load Applied to Agriculture (kg)	3,891.465
	Total Load in Runoff (kg)	90.093
	Concentration in Runoff	High
Benzo-(a)-pyrene	Total Load in Runoff (kg)	0.718
	Concentration in Runoff	Low
Nitrate-N	Total Load in Runoff (kg) [5]	1,117,863.463
	Concentration in Runoff	Low

Hughes, 2009

Example 2 – UK HT Drainflow





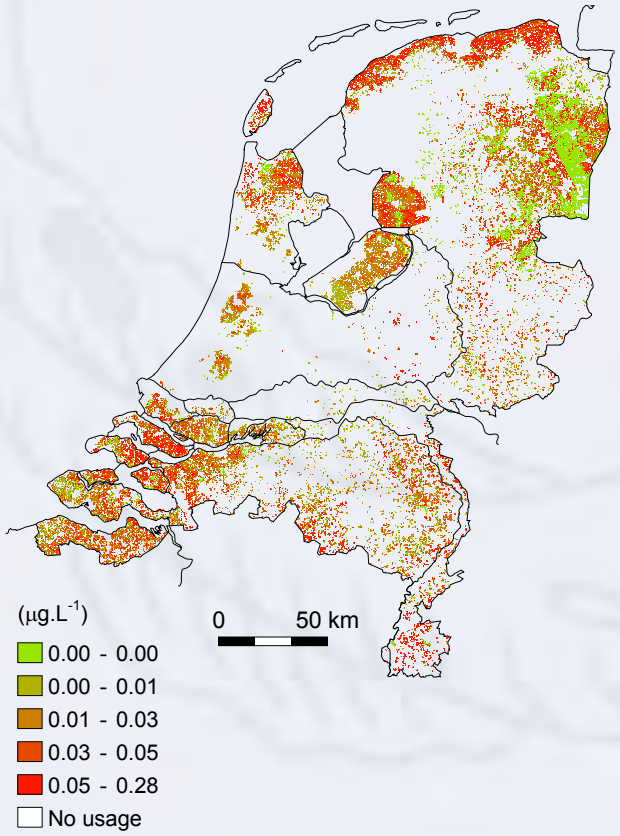
Soil type	Dry	Medium	Wet	>1000mm p.a.	Total extent (%)
Undrained	-	-	-	-	44.8
Peaty soils	-	-	-	-	1.54
Denchworth	2.0	5.2	1.3	0.0	8.6
Hanslope	5.1	11.4	0.7	0.0	17.3
Brockhurst	2.5	11.8	2.4	0.1	16.7
Clifton	0.6	6.3	1.7	0.1	8.7
Quorndon	1.1	1.0	0.3	0.0	2.4
Total	11.3	35.8	6.4	0.2	100

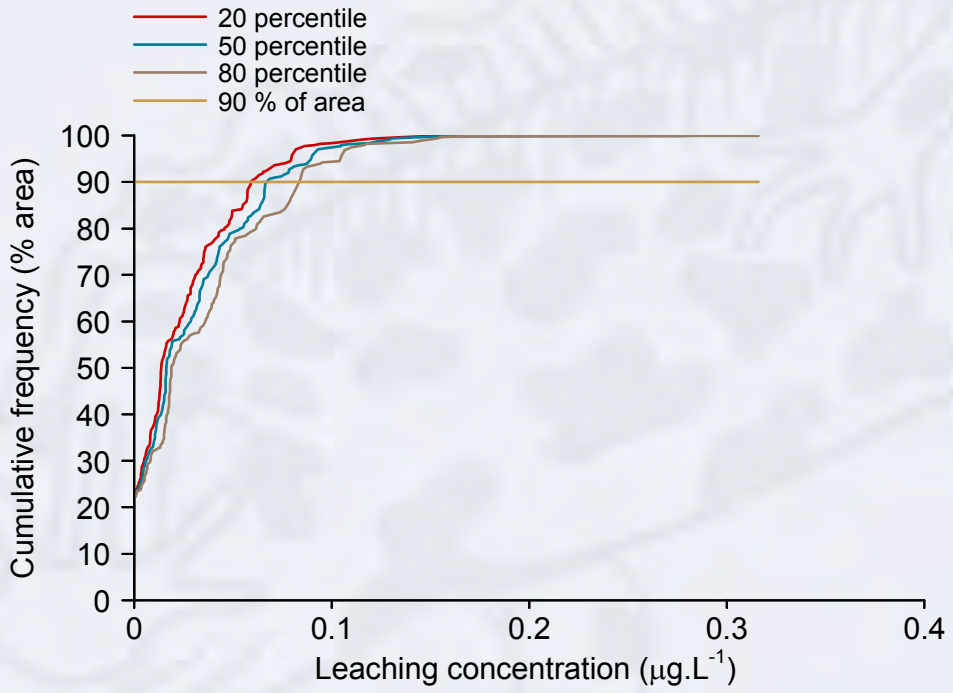
Threshold exceeded	2.7%
Unquantified*	0.2%
Undrained#	44.8%
Drained but below threshold	52.3%
Total	100%

Hughes and Ford, 2010

Example 3 – NL GW ERA

- GeoPEARL 3.3.3





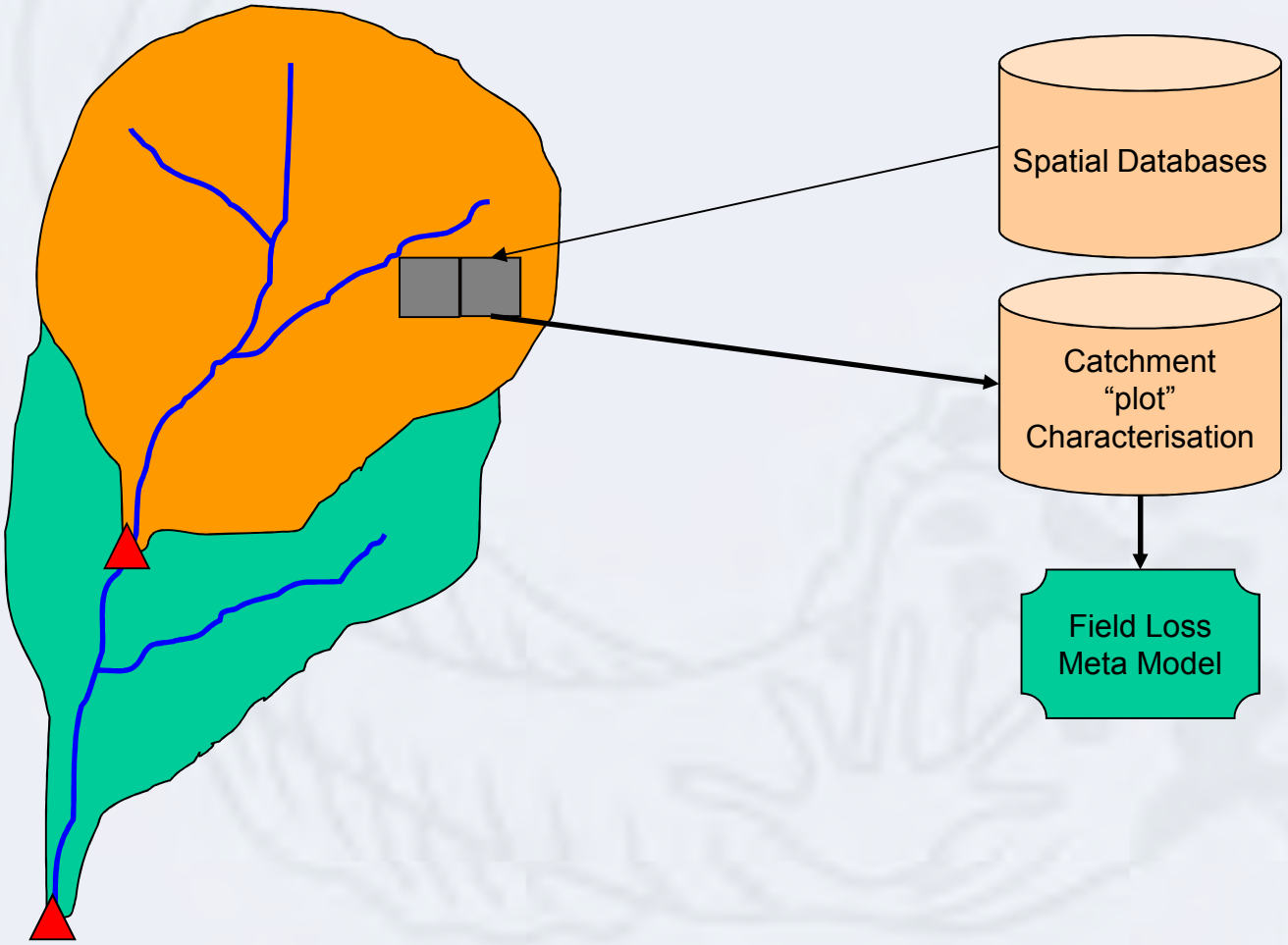
Hughes, 2010

CRD Minor Uses Project

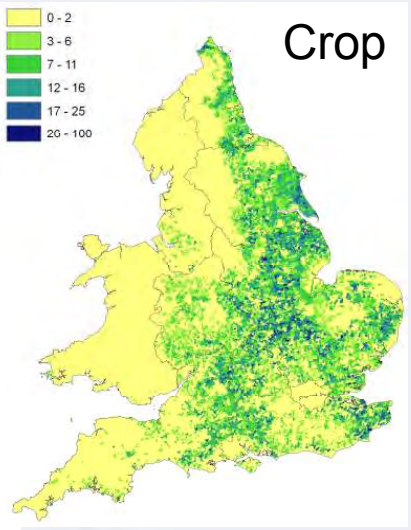
Aim

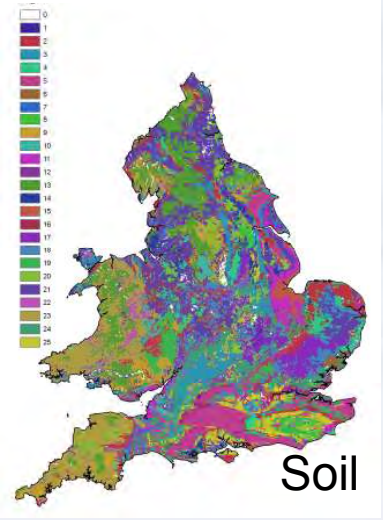
Develop a “matrix-like lookup” screening tool to compare major and minor usages through an objective assessment of their relative risks at edge of field and catchment scales

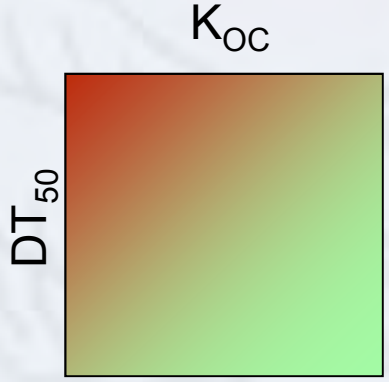
Model Schematisation



Field Loss Meta-Model

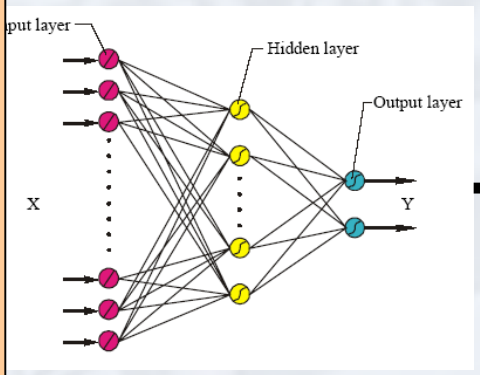






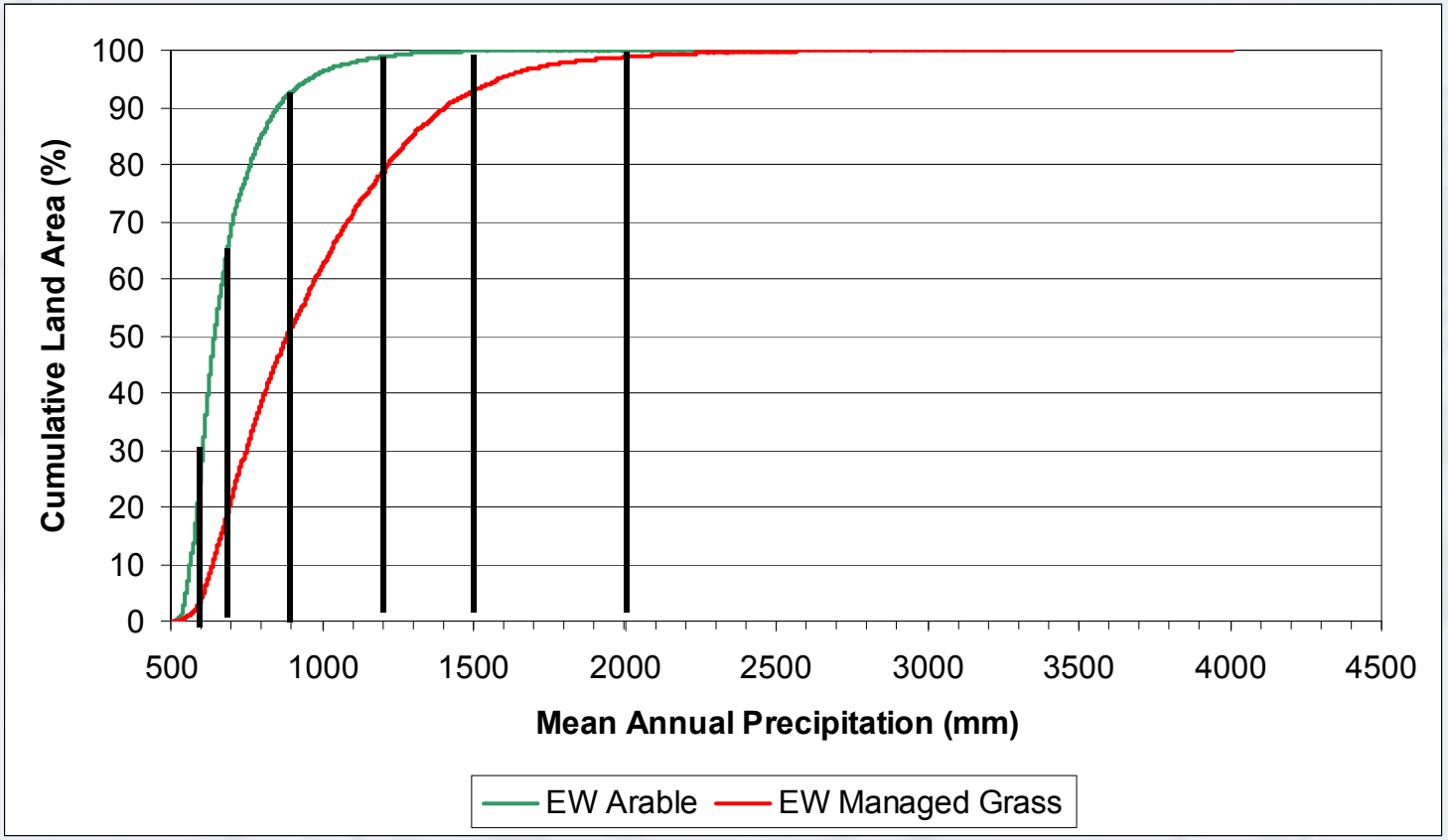
MACRO / PRZM

Statistical Model



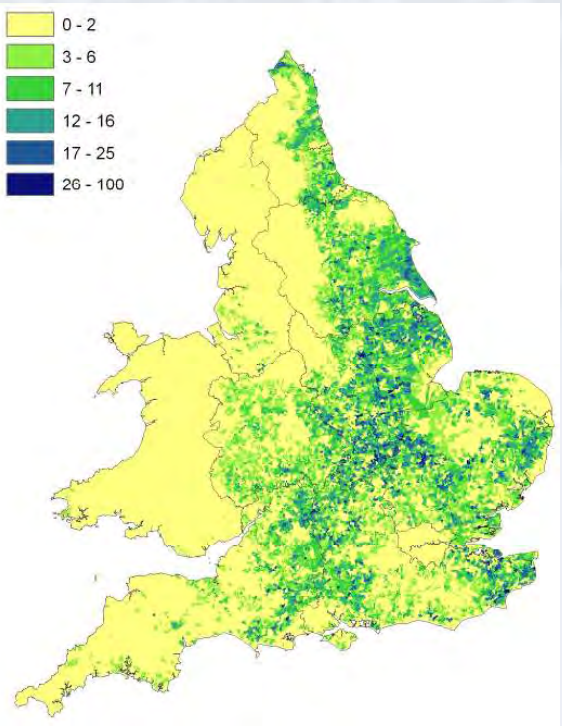
Field Loss Meta Model

Climate


Cumulative Land Area (%)
100
90
80
70
60
50
40
30
20
10
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Mean Annual Precipitation (mm)
EW Arable
EW Managed Grass

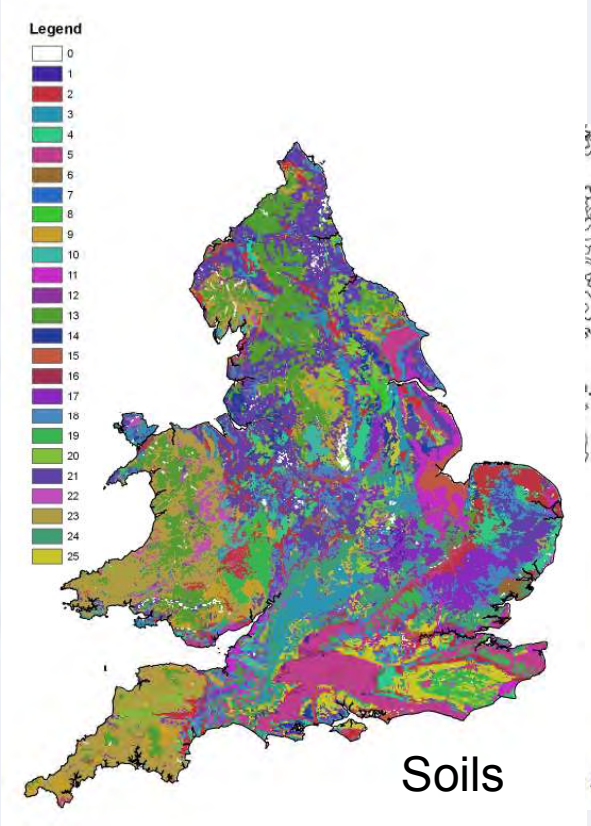
Crop

- Suite of minor and major crops
- FOCUS UK Crop Parameters

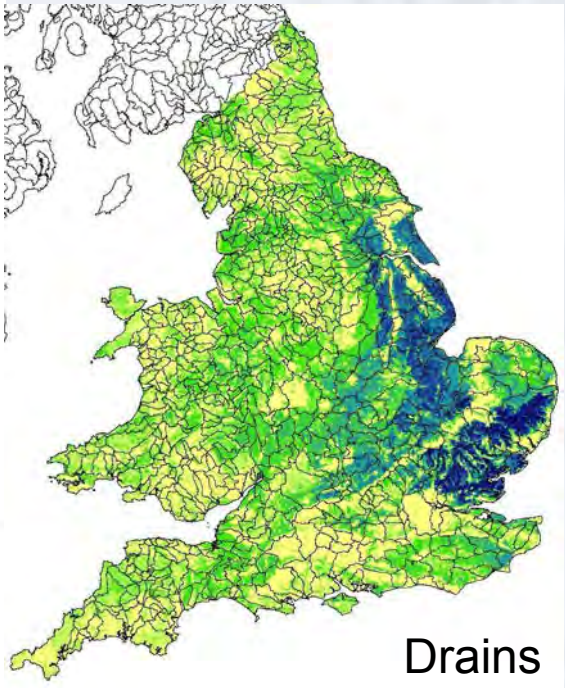


Soil

- Hydrology, Texture, Depth, OC Profile



Soils

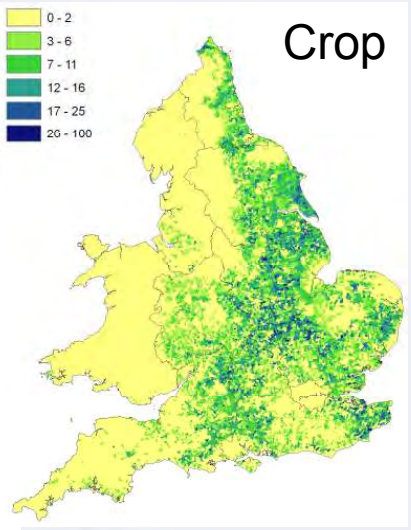


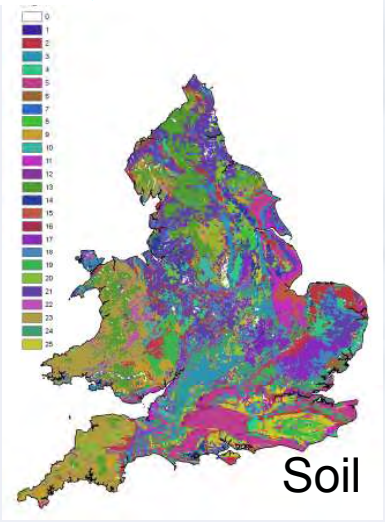
Drains

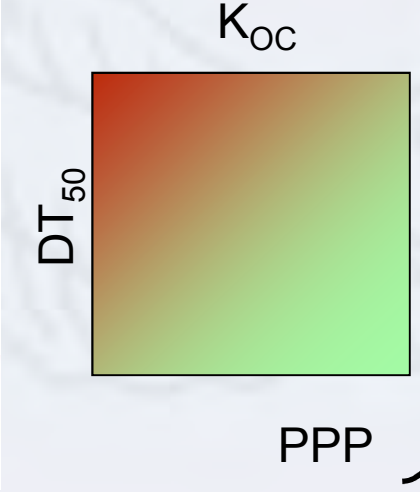
PPPs

DT50	Koc										
	5	20	50	100	200	500	1000	2000	5000	15000	Grand Total
2	5	7	13	10	9	11	13	10	5	11	94
5	5	9	6	8	9	6	6	7	4	9	69
10	2	14	12	10	9	6	3	11	5	12	84
20	8	11	9	17	23	10	15	17	16	23	149
50	6	5	8	11	22	23	15	10	15	28	143
100	2	2	6	6	5	14	7	7	11	14	74
200	3	1	4	3	10	8	11	6	2	18	30
Grand Total	31	49	58	65	87	78	70	68	58	115	679

Field Loss Meta-Model

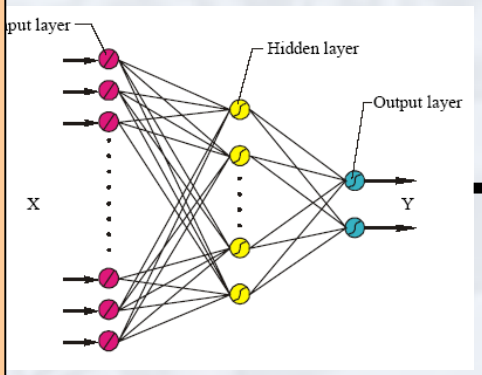






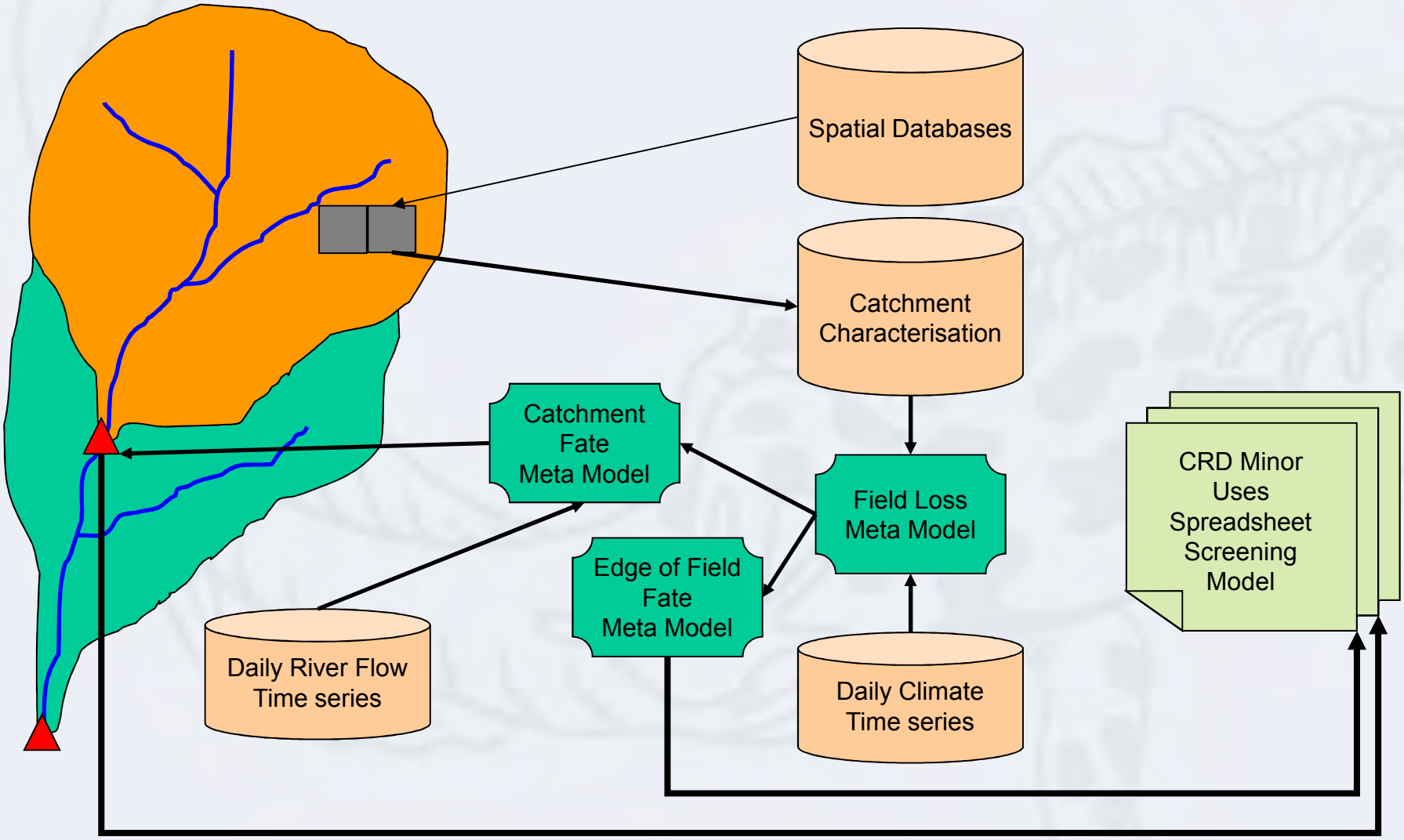
MACRO / PRZM

Statistical Models



Field Loss Meta Model

Model Schematisation



Model Output

For a major and a minor usage

- Area summaries of total crop area and area leading to edge of field end point exceedances
- Catchment summaries of catchment scale exceedances (EQS/DWS)

Timeframes

- Start – June 2010
- Beta Version – Mar 2011
- Complete – Jul 2011

Thank You

Greg Hughes
Woodthorne
Wergs Road
Wolverhampton
WV6 8TQ
UK

Tel: +44 (0)1902 693254
Fax: +44 (0)1902 693400
greg.hughes@cea-res.co.uk
www.cea-res.co.uk