Cambridge Environmental Assessments

Impact of Minor Uses: Development of the CRD Minor Uses Screening Tool

Background

Regulatory Question….

"There is a potentially high risk from the use of a pesticide on Christmas trees that is already approved for use on wheat - should we be worried?"

Background

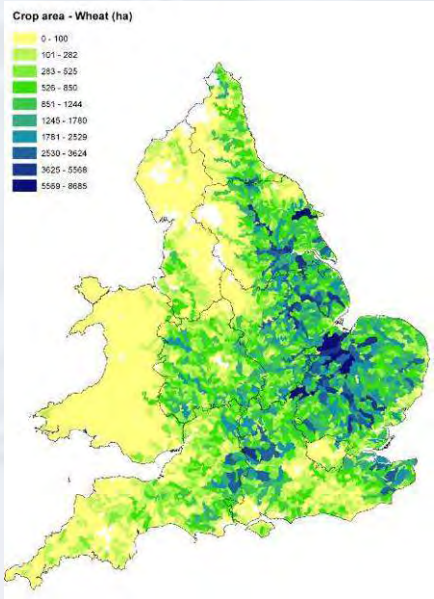
It is often argued that …

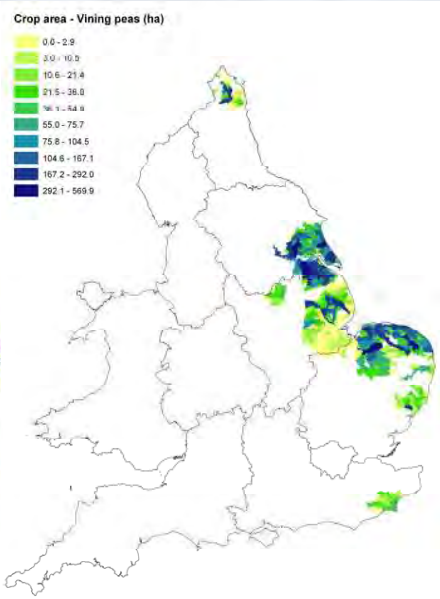
"Limited scale of use should be a mitigating factor when considering risk assessment results"

"An existing approval for use of a product on an extensive crop/basis should aid deliberations of safe use on a limited crop/basis"

Problem is ….

- Minor crop may be grown in different locations
- Often clustered into potential hotspots
- Possibly on vulnerable soils – e.g. sands
- Different application regimes – amount/timing

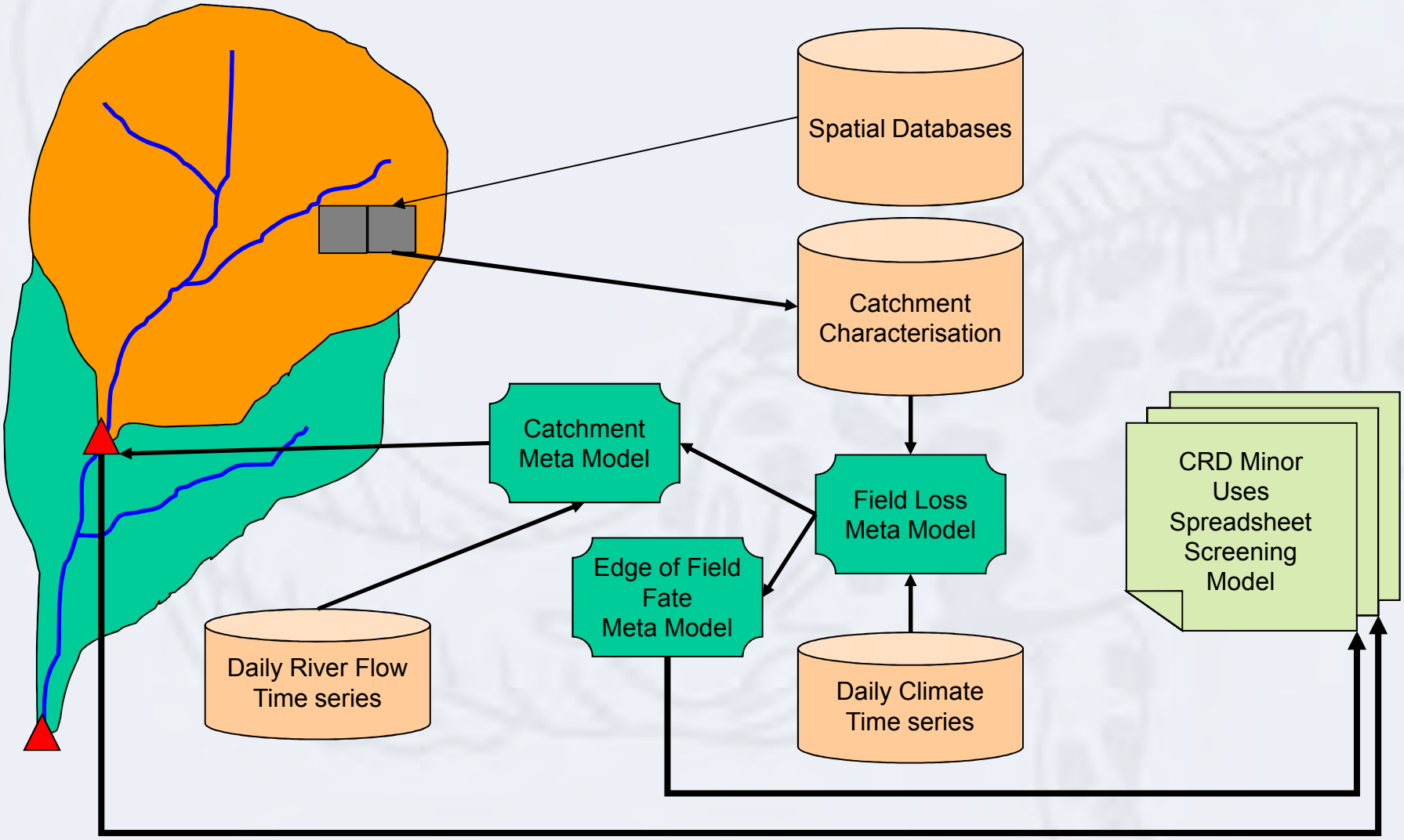




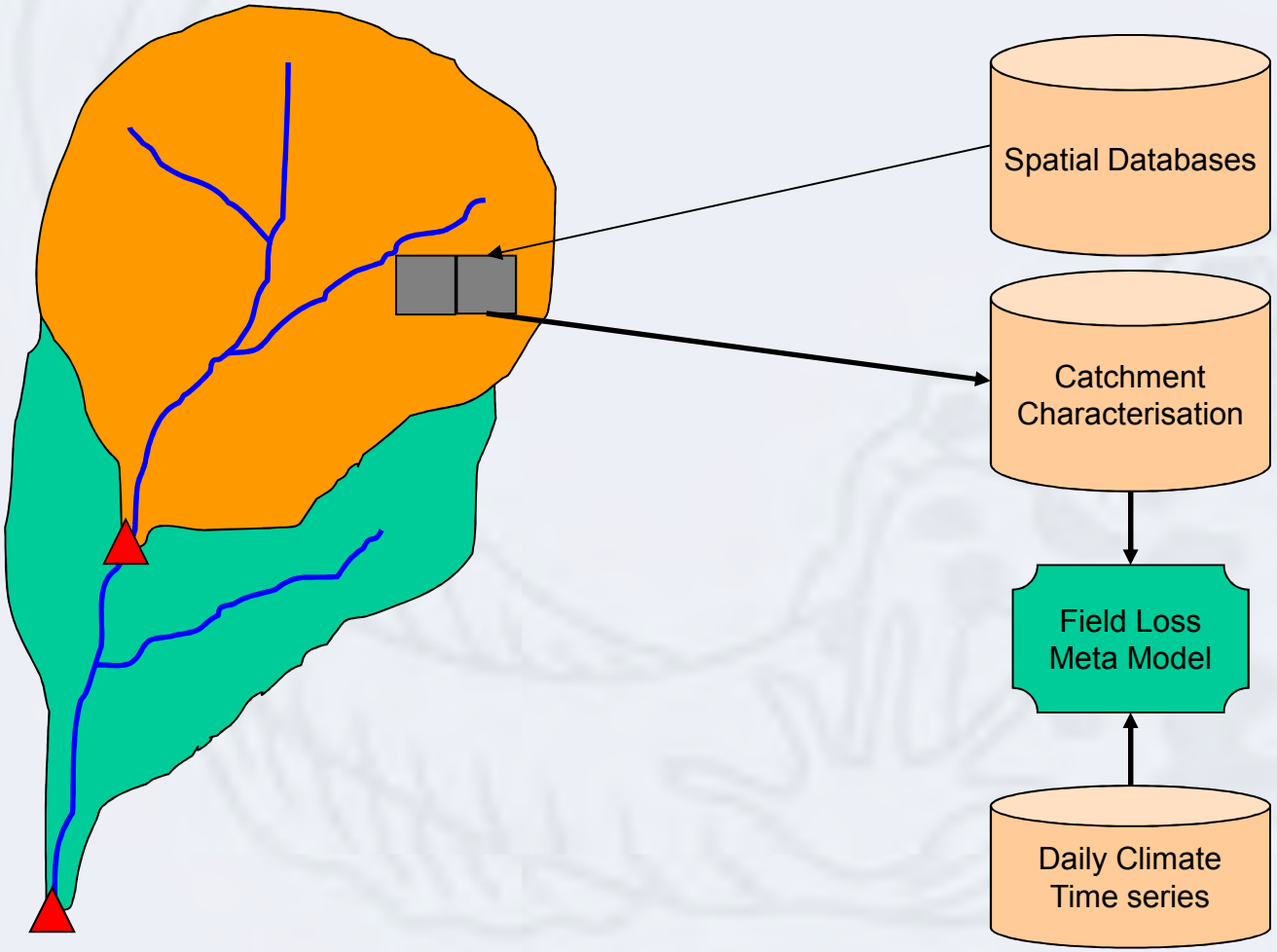
Project Objective

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



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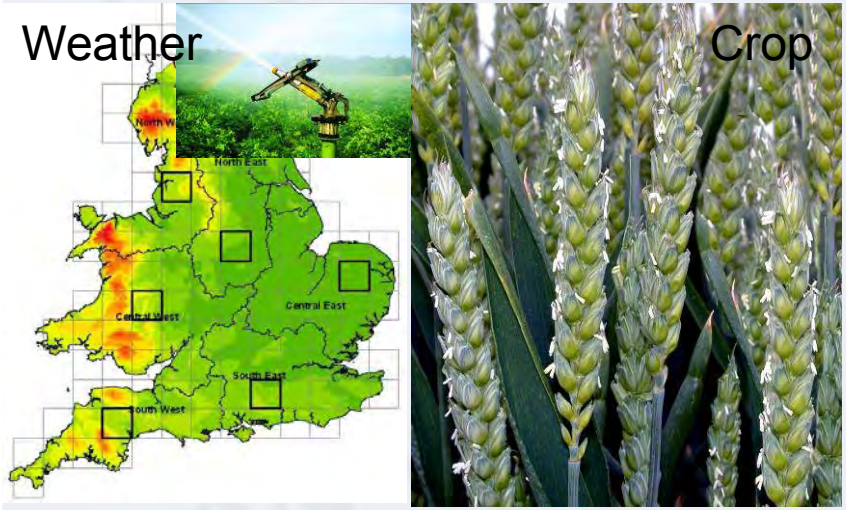
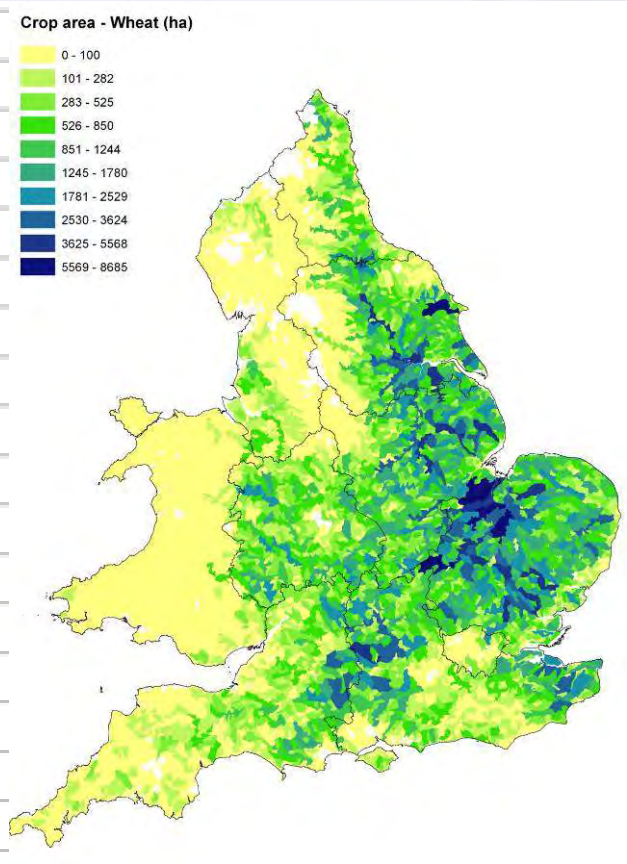


Major Crops

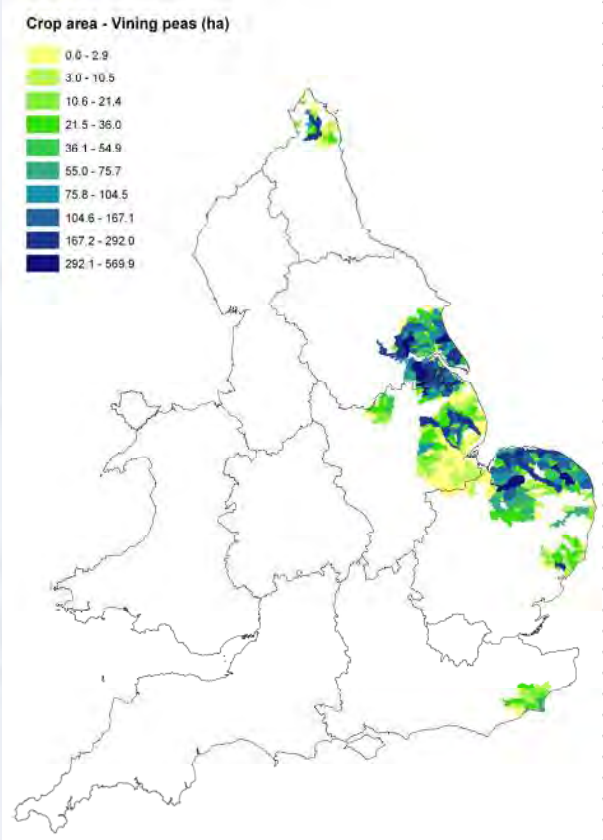
ADAS 2009 Land Use Dataset

Winter Wheat
Spring Wheat
Winter barley
Spring barley
Oats
Mixed Grain
Potatoes
Sugarbeet
Winter OSR
Spring OSR
Field Beans
Peas Dry
Maize
Root Fodder Crops
Other Crops for Stock Feeding
Bare Fallow
Grassland



Minor Crops

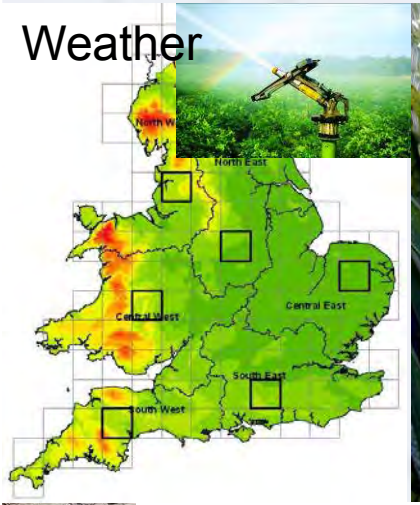
ADAS 2009 Land Use Dataset



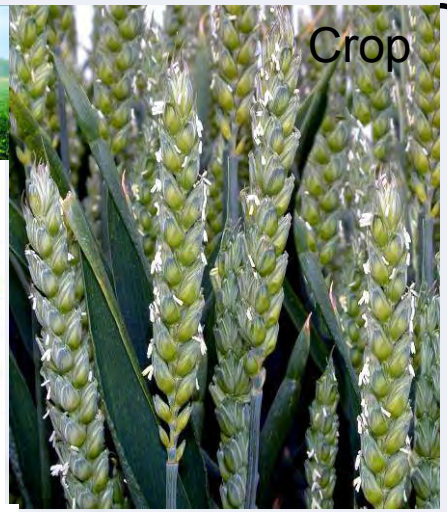
Rye
Triticale
Linseed
Apples
Pears
Plums
Other Topfruit
Strawberries
Raspberries
Blackcurrants
Wine grapes
Other small fruit
Hops
Christmas Trees
Flowers Grown in the Open
Asparagus
Beans
Beetroot
Field Celery
Lettuce & leaf veg
Peas for processing
Rhubarb (Natural)
Salad Onions
Swede & Turnips
Brussel Sprouts
Cabbage
Calabrese
Cauliflowers
Other Brassicas
Carrots
Parsnips
Bulb Onions
Leeks
Cougettes
Field Grown Herbs
Golf Course - All
Golf Course - Fairways
Golf Course - Greens
Golf Course - Rough
Urban Green Space

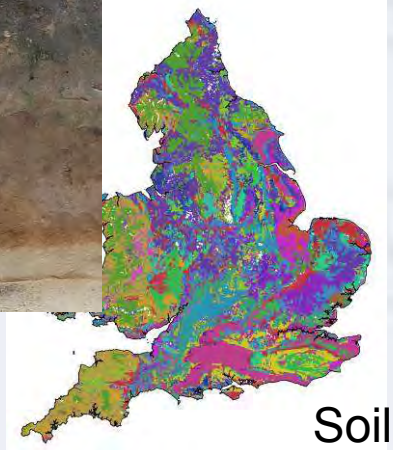
Field Loss Meta-Model

Weather



Crop



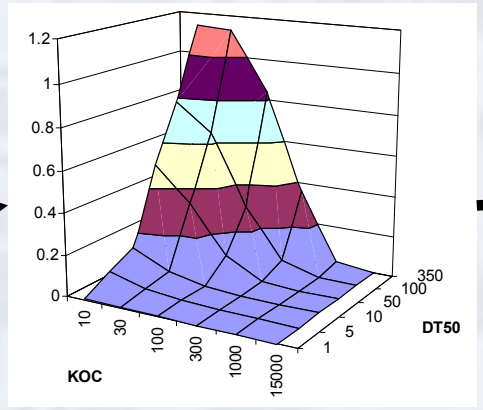


Soil

	K_{OC}[$]						
DT_{50}	10	30	100	300	1000	>1000†	Total
1	2	3	6	6	14	13	44
5	4	9	18	7	12	34	84
10	3	11	19	13	12	21	79
50	12	16	34	50	45	115	272
100	3	5	12	16	27	41	104
>100‡	4		11	13	20	48	96
Total	28	44	100	105	130	272	679

PPP

MACRO / PRZM



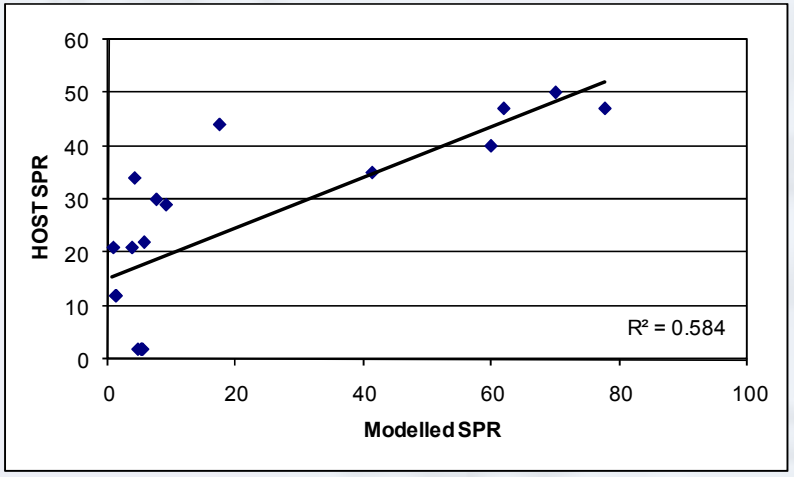
Field Loss Meta Model

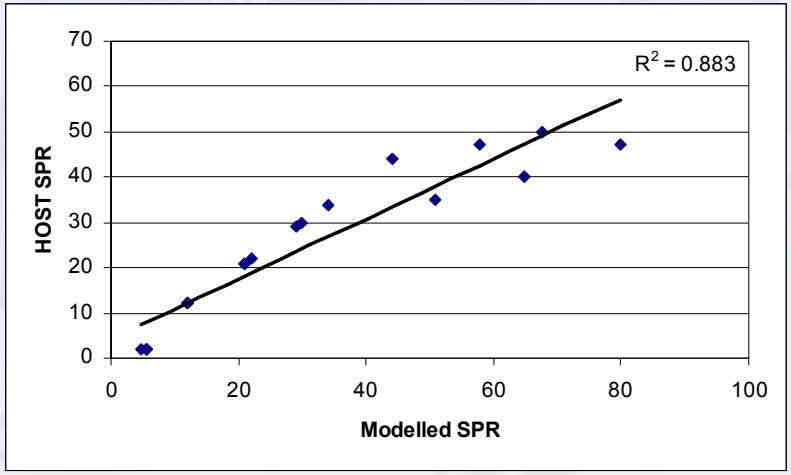
PRZM – DAA, AIWater, AISed, Runoff, Infiltration

MACRO – DAA, AIWater, Drain flow

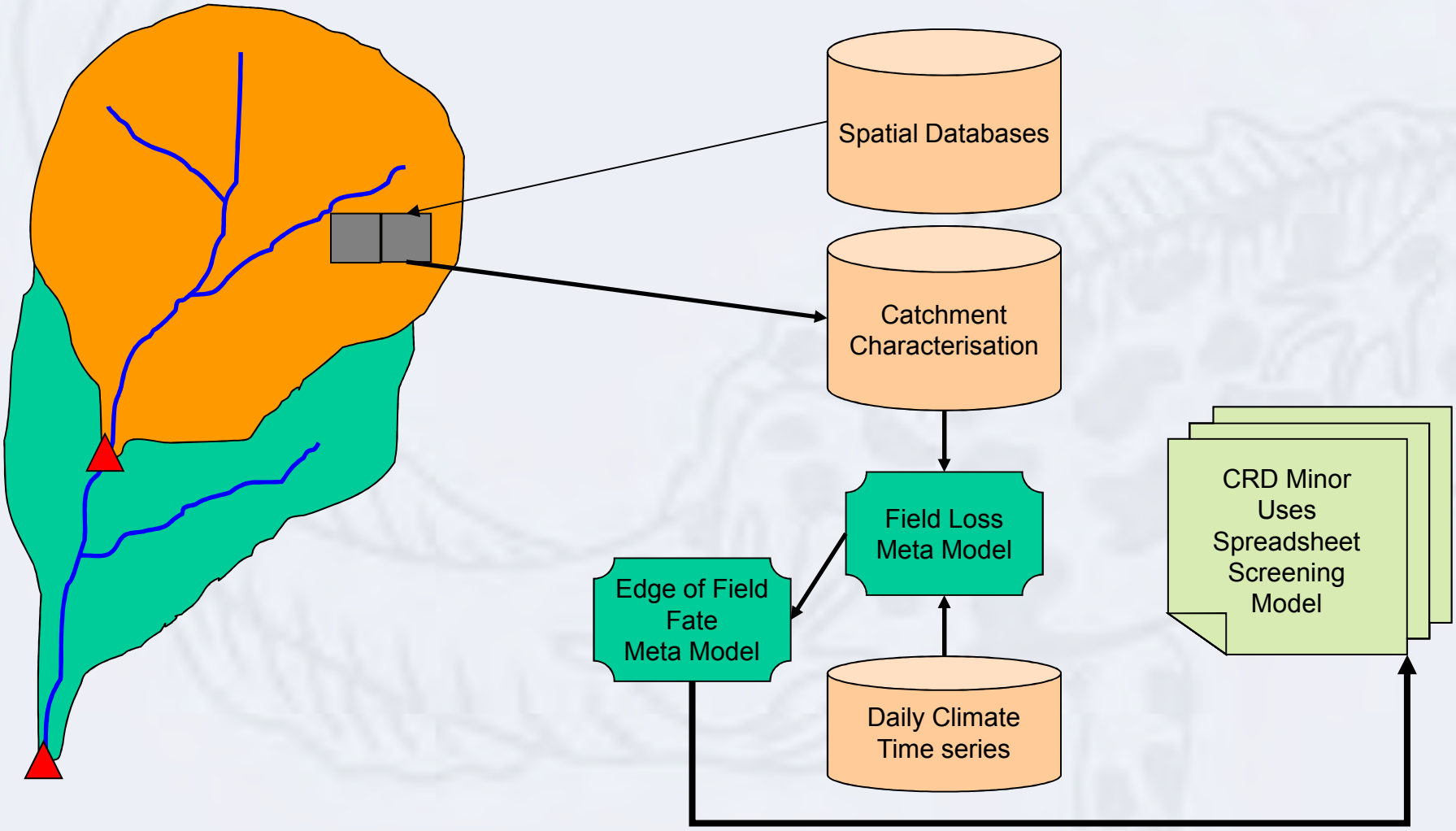
Field Loss Model Evaluation

- HOST SPR comparison
- Proportion infiltration that runs off



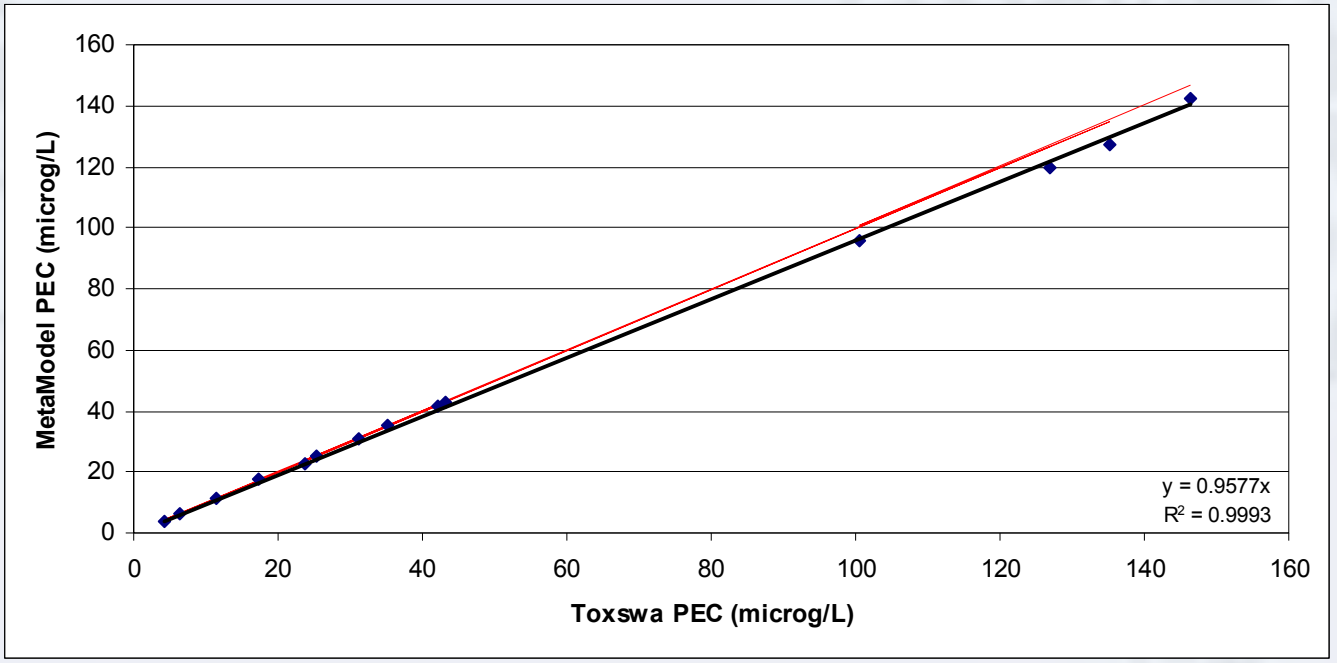


Edge of Field Meta-Model

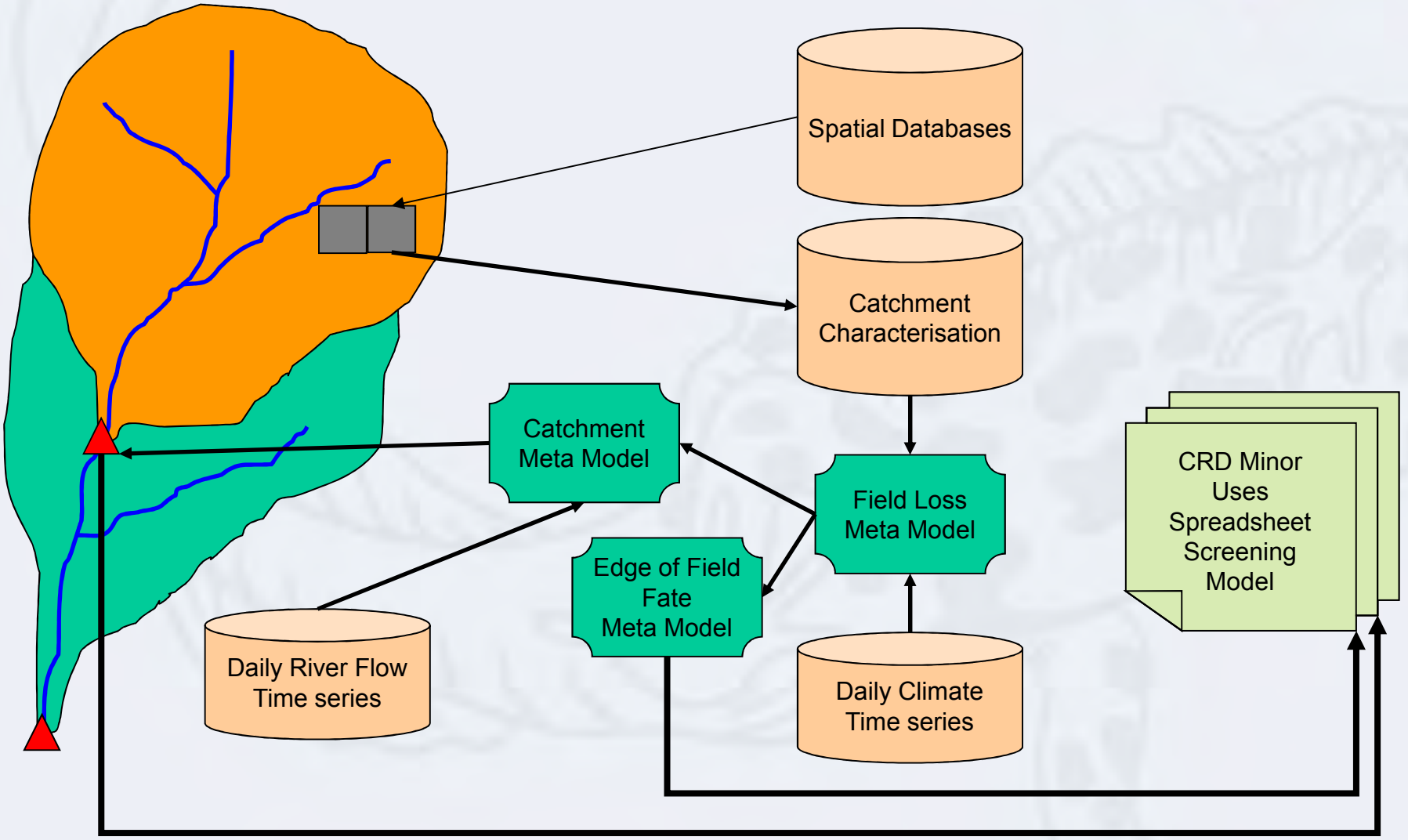


EOF Meta-model Evaluation

- Based on STEPS Model – STEP3
- Water bodies
  - D2 – Drained Soils; R2 – Runoff Soils

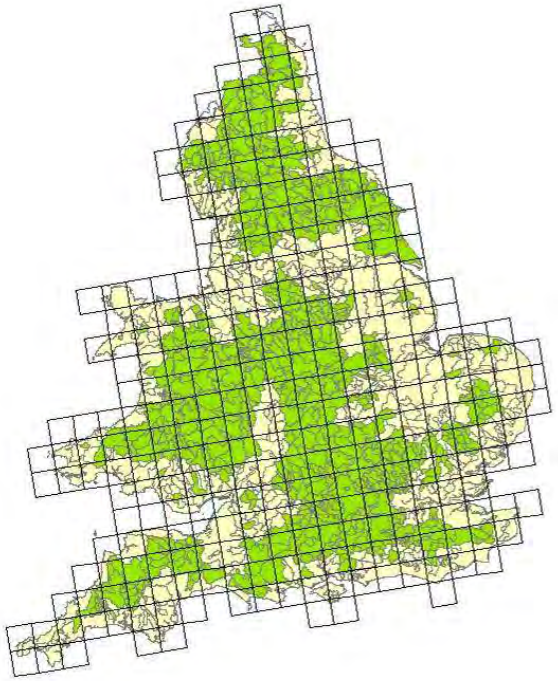


Catchment Meta-Model

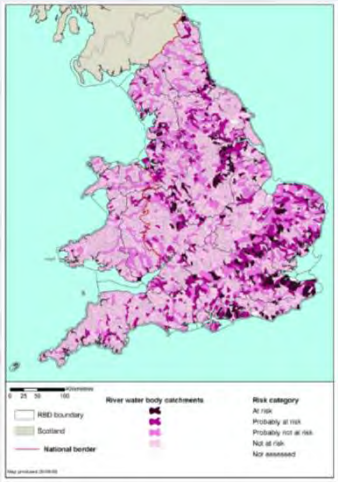


Catchment Flow

- Observed flows
- 320 hydrometric catchments



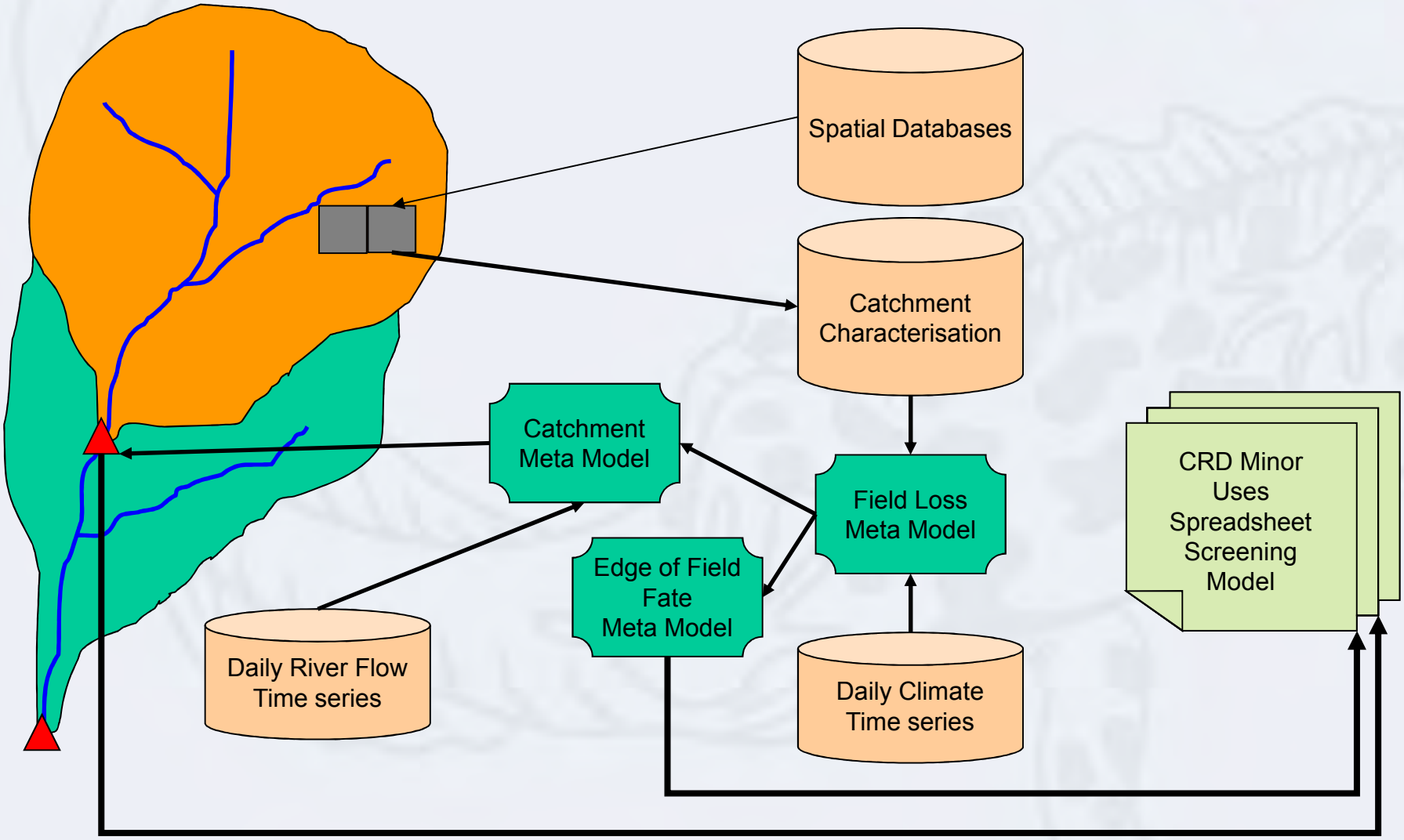
- Drift flows ~ FOCUS PAT dates
- Runoff flows ~ Max runoff event
- Drain flows ~ Max drain flow



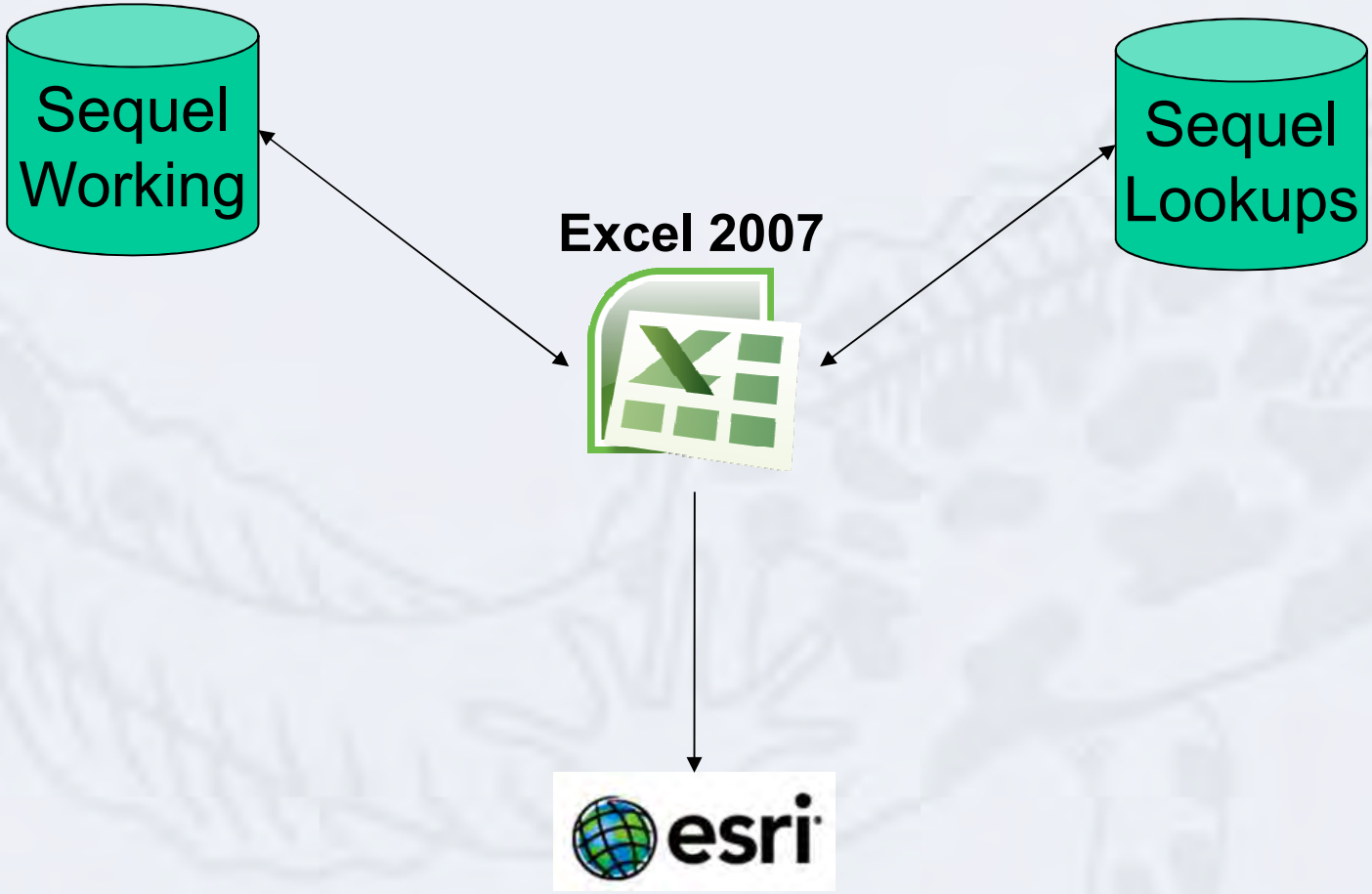
Stepwise GLM;
Best model
selected by AIC

Monthly Flow ~
Q95/Qave
PrecipMonth
SPRHOST
DD
LakeArea

Model Schematisation

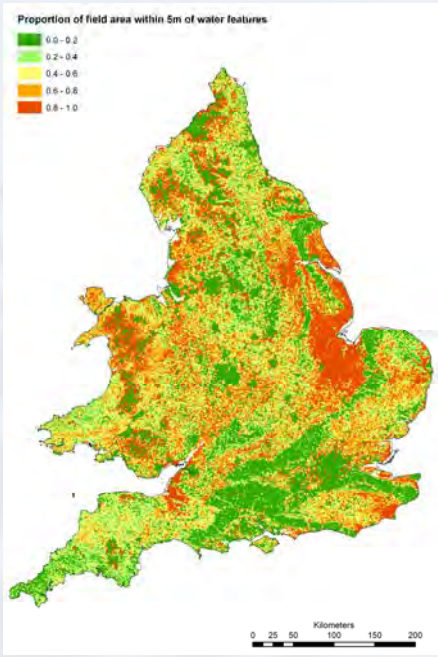


MUS Tool Design



MUS Tool

- Weights
  - Crop proportion
  - Product usage
  - Drain prevalence
  - Runoff connectivity
- Outputs
  - EOF/Catchment concs classed using threshold + SF
  - Side by side output of major/minor crops
  - Drift, Drift+Runoff, Drift+Drainflow, All
  - Area of crop resulting in different risk classes
  - Number of catchments resulting in different risk classes
  - Cross tabbed by current WFD status



Area of Crops (ha)	EA Catchment Class				
CRD Tool Class	1a	1b	2a	2b	All
At Risk (AR)	22	15	10	5	52
Possibly At Risk (PAR)	2	55	12	7	76
Not At Risk (NAR)	32	44	355	668	1099
All	56	114	377	680	1227

MUST Progress

- Tool testing underway – June 2011
- Tool evaluation against monitoring data – July 2011
- Complete August 2011

Thank You

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