Can scale of use be used in aquatic risk assessments?
Contents

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  – Drinking Water Safety Plans (UK)
  – UK HT Drainflow
  – Groundwater RA (NL)
• Minor Uses Project
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  – 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

Hughes, 2009

<table>
<thead>
<tr>
<th>Compound</th>
<th>Total Load Applied to Agriculture (kg)</th>
<th>Total Load in Runoff (kg)</th>
<th>Concentration in Runoff</th>
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</thead>
<tbody>
<tr>
<td>Mecoprop-P</td>
<td>5.672</td>
<td>4.220E-02</td>
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<tr>
<td>Benzo-(a)-pyrene</td>
<td>3,891.465</td>
<td>90.093</td>
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<tr>
<td>Nitrate-N</td>
<td>1,117,863.463</td>
<td>0.718</td>
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</table>
Example 2 – UK HT Drainflow

<table>
<thead>
<tr>
<th>Soil type</th>
<th>Dry</th>
<th>Medium</th>
<th>Wet</th>
<th>&gt;1000mm p.a.</th>
<th>Total extent (%)</th>
</tr>
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<tbody>
<tr>
<td>Undrained</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>44.8</td>
</tr>
<tr>
<td>Peaty soils</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.54</td>
</tr>
<tr>
<td>Denchworth</td>
<td>2.0</td>
<td>5.2</td>
<td>1.3</td>
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<tr>
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<tr>
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<td>1.7</td>
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<tr>
<td>Quorndon</td>
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<td>1.0</td>
<td>0.3</td>
<td>0.0</td>
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<tr>
<td>Total</td>
<td>11.3</td>
<td>35.8</td>
<td>6.4</td>
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<table>
<thead>
<tr>
<th>Threshold exceeded</th>
<th>2.7%</th>
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<tbody>
<tr>
<td>Unquantified*</td>
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<td>Undrained#</td>
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<tr>
<td>Drained but below threshold</td>
<td>52.3%</td>
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<tr>
<td>Total</td>
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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

- Spatial Databases
- Catchment “plot” Characterisation
- Field Loss Meta Model
Field Loss Meta-Model

Climate

Crop

Soil

KOC

DT50

PPP

MACRO / PRZM

Statistical Model

Drift

Field Loss Meta Model
Climate

![Graph showing cumulative land area (%) against mean annual precipitation (mm). The graph includes two curves: one for EW Arable and one for EW Managed Grass.]
Crop

• Suite of minor and major crops
• FOCUS UK Crop Parameters
Soil

- Hydrology, Texture, Depth, OC Profile
### PPPs

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<th>50</th>
<th>100</th>
<th>200</th>
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<td>70</td>
<td>68</td>
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<td>679</td>
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</tbody>
</table>
Field Loss Meta-Model

Climate

Crop

Soil

PPP

K_{OC}

\text{MACRO / PRZM}

Statistical Models

Drift

Field Loss Meta Model
Model Schematisation

- Daily River Flow Time series
- Daily Climate Time series
- Spatial Databases
- Catchment Characterisation
- Field Loss Meta Model
- Edge of Field Fate Meta Model
- Catchment Fate Meta Model
- CRD Minor Uses Spreadsheet Screening Model
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

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