Overview

> First 25 minutes: PPT presentation

> Last 5 minutes: computer demonstration
The FOOTPRINT project

> 3-year project funded by the EU as part of FP6
> A research project, but with very applied deliverables (computer tools)
> 15 partners from 9 European countries
> Started in January 2006

The FOOTPRINT partners
The FOOTPRINT (football) team in Piacenza

Project objectives

> Overall objective: to develop a set of computer tools that will allow users to:
  * i) identify the dominant pathways and sources of pesticide contamination in the agricultural landscape.
  * ii) estimate levels of pesticide concentrations entering surface water and groundwater.
  * iii) make scientifically-based assessments of how the implementation of risk reduction strategies is likely to reduce pesticide contamination of water resources.
Project goals

> 1) to develop a suite of three pesticide risk assessment and management tools, for use by three different user communities:
  
  • Policy makers/registration authorities at the national/EU scale.
  • Water managers at the catchment scale
  • Farmers and extension advisers at the local (farm) scale

> 2) to evaluate the usability and performance of the FOOT tools at their various scales of application.

The FOOT-NES tool

> To be used at the large scale by EU and member states policy and decision-makers (and pesticide registration authorities?)

> Emphasis on:
  
  1. Identifying the areas most at risk from pesticide contamination
  2. Assess the probability of pesticide concentrations exceeding legal or ecotoxicologically-based thresholds

> Add-on in ArcGIS
The FOOT-CRS tool

> To be used at catchment level by local authorities, stewardship managers, water companies (‘water managers’)  

> Emphasis on:  
  1. Identifying the areas most contributing to the contamination of water resources by pesticides  
  2. Defining and/or optimising action plans at the scale of the catchment (what-if scenarios)  

> Add-on in ArcGIS

The FOOT-FS tool

> To be used at the farm level by extension advisers and farmers  

> Emphasis on:  
  1. Identifying the pathways and areas most contributing to contamination of water resources by pesticides  
  2. Providing site-specific recommendations to limit transfers of pesticides in the local agricultural landscape  

> Stand-alone application & web portal
How does it work?

Millions of model runs involved!

MACRO
- drainage, leaching

PRZM
- runoff, erosion

'Pesticide loss' (different expressions in the various tools)

Giant DB of modelling results

'Pesticide loss' (different expressions in the various tools)
Developing agro-environmental scenarios for the whole of the EU27

cf. talk by Tiziana Centofanti in the FOOTPRINT parallel session

www.eu-footprint.org

FOOTPRINT climatic zones

> Identification of key climatic factors regulating the transport of pesticides to drains and to depth

> Use of the key factors to identify 'homogeneous zones' with regard to pesticide transfer.

> Assignment of representative stations to each of the FCZs

www.eu-footprint.org
FOOTPRINT soil types & classes of contamination pathways

cf. talk by Tiziana Centofanti in the FOOTPRINT parallel session

www.eu-footprint.org

Agronomic and associated information

cf. talk by Tiziana Centofanti in the FOOTPRINT parallel session

www.eu-footprint.org
FOOTPRINT agro-environmental scenarios - size matters!

> 16 FCZs
> 254 FSTs
> 42 crops
> 12 appl. Dates
> ca. 13,000 FAES
> ca. 90,000 FAES

The 4 key stages in FOOTPRINT

FOOTPRINT PPDB

Evaluation

Tool development & feedback

Modelling & meta-modelling

Scenario development

FOOTPRINT SUGAR
The FOOTPRINT PPDB

> **FOOTPRINT Pesticide Properties Database**
> Put together by the University of Hertfordshire for FOOTPRINT
> Holds environmental fate and ecotoxicological data for all ca. 700 compounds registered in the EU and 250 metabolites
> Quality assurance scheme (origin of the data + confidence)
> Numerous internal and external quality checks
> Free online access via the FOOTPRINT web site

http://www.eu-footprint.org/ppdb.html
The FOOTPRINT SUGAR index

> SUGAR = SUrface water / GroundwAter contRibution index
> Tells whether a particular piece of land contributes to groundwater or surface water
> Based on observed data only!
> Combines two approaches for hydrological assessments
  • IDPR - *Index de développement et de Persistence des Réseaux*
  • SPR for FOOTPRINT agro-environmental scenarios

SUGAR = f(IDPR, SPR)

> IDPR
  • Based only on real, readily-available, data
  • Altitudes (DTM) and Surface Water network
  • Computes a hypothetical SW network and compares it to the observed one
  • The difference between the 2 networks provides an indication of water pathways

> SPR
  • Standard Percentage Runoff used in catchment hydrology (responsiveness)
  • SPR attached to each FOOTPRINT soil type
The FOOTPRINT SUGAR maps

- SUGAR map computed for the whole of the EU
  - 1:1M DCW for surface network
  - SRTM 90 x 90 m for DTM
  - FOOTPRINT agro-environmental scenarios

- Internal workshop held to validate SUGAR in specific countries, but clear need for additional validation

- Have a look at the map and tell us what you think!
How can I use SUGAR?

> Overlay with predicted pesticide loss at 1-m depth
> Optimise/rationalise monitoring programs and stewardship campaigns
> Identify areas of special interest (SW, GW)
> Assess groundwater recharge
> Assess groundwater vulnerability (e.g. overlay with depth to aquifer, usage, etc)
> ....
> Don't use it to sweeten coffee, it doesn't work ;-)

Making SUGAR available

> Availability through the FOOTPRINT web site:
  • Geographical coverage
    − For the whole of the EU
    − For individual EU member states
  • Formats
    − Jpeg (images)
    − ESRI ArcGIS lyr
    − GoogleEarth

> Expected release: end of 2007
> SUGAR can be computed at a much finer scale (in particular for catchment and nationwide applications)
  • Get in touch if you are interested and can provide us with the relevant data (DTM, surface water network)
First demo of FOOT-FS (farm scale)

> FOOT-FS is developed by the University of Hertfordshire
> An 'α1' version presented today for the first time…
> …to give you a first feel regarding what FOOT-FS will be
> Beware:
  • Content may (will) change
  • Form may (will) change

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FOOT-FS in practice (PC version)

(1) Pesticide Programme Manager
(2) Agro-environment Scenario Manager
(3) Modelling, risk assessment
(4) Results interpretation & communication

Language filter

Point sources Audit

www.eu-footprint.org
FOOT-FS

Focus today on the ‘FOOT-FS scenario builder’

The FOOT-FS Pesticide Programme Builder

The FOOT-FS Point Source Pollution Audit

From scenarios to FOOT-FS outputs

Application dates, rates + identity of compounds

Contamination pathways

20-year daily concentrations and fluxes (drainage, leaching, runoff, erosion)

A single ‘index’, ‘score’, ‘indicator’

Scenario-specific mitigation measures with detailed recommendations

www.eu-footprint.org
And FOOT-CRS and FOOT-NES?

Can I have another 3 hours?

Parallel session on FOOTPRINT

> 5 talks presenting some of the supporting science in FOOTPRINT

What are the key climatic factors driving pesticide losses in fate models?

How effective are mitigation measures?

How to parameterise MACRO for all these scenarios for the EU?
Conclusions and perspectives

> The FOOTPRINT team is fully dedicated to deliver innovative tools for pesticide risk assessment, management and reduction

> Genuine will among us to see the 3 FOOTPRINT tools used by a wide diversity of users

> I'm interested. What do I do?
  • Visit www.eu-footprint.org
  • Register with the FOOTPRINT announcement list
  • Attend the FOOTPRINT annual meeting (22-23 November 2007 near Ispra, Italy)

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www.eu-footprint.org
i.dubus@eu-footprint.org