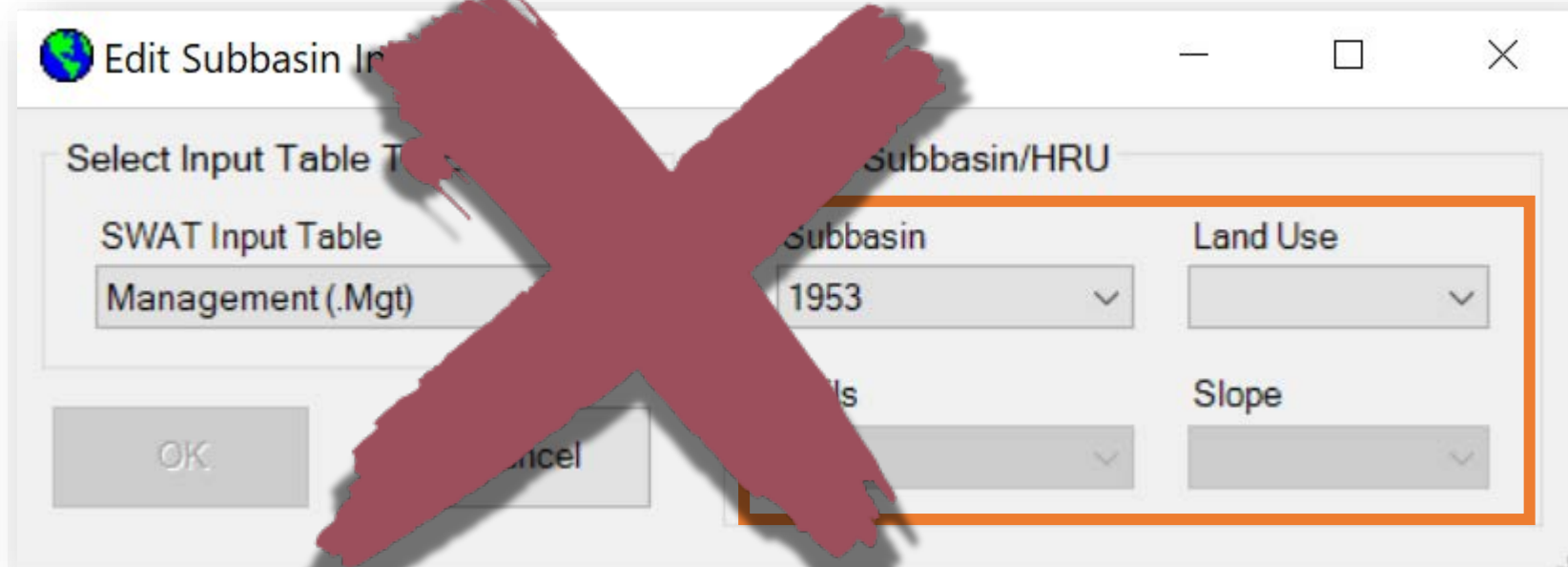# Automated implementation
of auto-irrigation in SWAT

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SWAT 2017|WARSAW

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Irrigation Map

Preview

1. What is PAIC SWAT?

2. How was irrigation setup implemented in workflow?

3. What are the benefits of our method?

PAIC-SWAT is a workflow
for building SWAT models

Prepare input data

Provide all necessary settings

Run the main code

Follow predefined
folder structure

Provide all required data

PAIC-SWAT is a workflow
for building SWAT models

Prepare input data

File paths

Field Names

Provide all necessary settings

Values and thresholds

Run the main code

PAIC-SWAT is a workflow
for building SWAT models

Prepare input data

Provide all necessary settings

Run the main code

GIS operations

↓

Read geo-spatial information
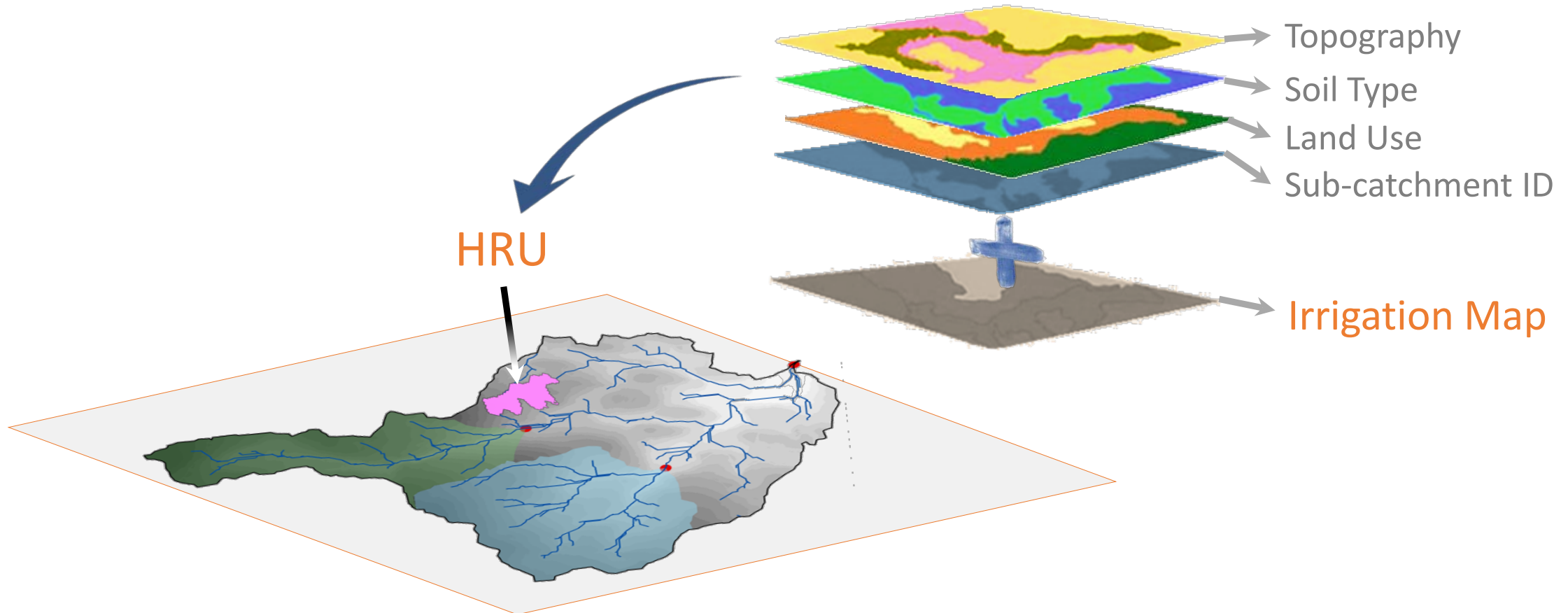
↓

Prepare .mdb files & initialise

↓

Fill .mdb file and create SWAT setup

overview

We modified PAIC-SWAT
to include irrigation map

Topography

Soil Type

Land Use

Sub-catchment ID

Irrigation Map

HRU

We added a module
to apply auto irrigation in HRUs

Read irrigation settings

Modify management files

Parameters

File path (for .mdb file)

We added a module
to apply auto irrigation in HRUs

Read irrigation settings

Modify management files

Read HRU table from Database

Identify HRUs with Irrigation

Check if Irrigation is already implemented

Skip

Write auto irrigation parameters

overview

The method is more accurate:
Irrigation is applied in the right area

One HRU

Irrigated

Not irrigated

Two HRUs
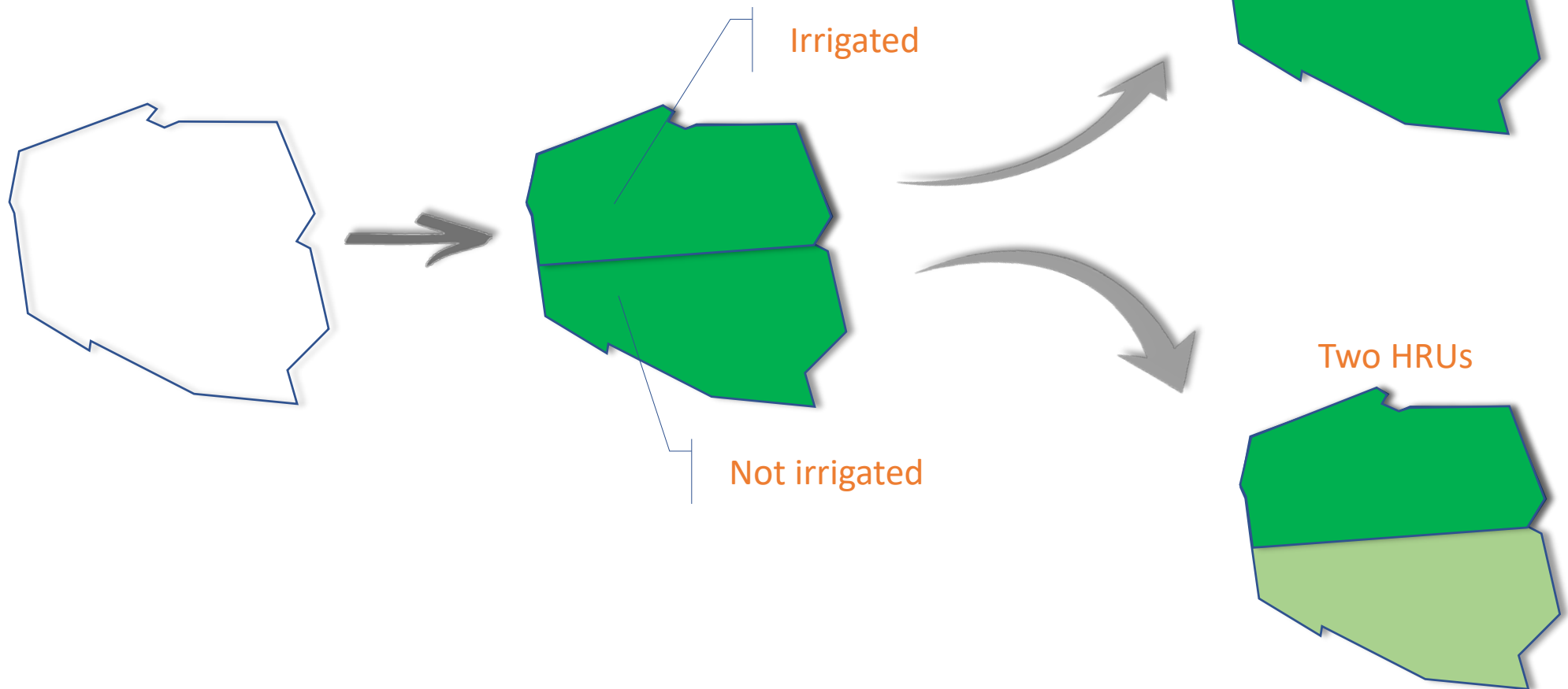
The method is more efficient

You save time

You save effort

PAIC-SWAT is a workflow
for creating SWAT models

We added an option to the platform
to apply irrigation from map

Our method is accurate
and more efficient

Applying auto-irrigation in large scale SWAT

does not need many manual adaptations to the model

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Irrigation is inserted
after planting

```
1                          | NROT:number of years of rotation

    0.150  1     2     10    1235.00000    8.00      12.00000 0.13  14.00 15.00
    0.010 11     1             0.75000    0.00       0.00000 0.00   0.00
    1.200  5                   0.00000
          17
```

```
1                          | NROT:number of years of rotation

    0.150  1     2     10    1235.00000    8.00      12.00000 0.13  14.00 15.00
    0.150 10     1  5          0.10000    0.20       0.30000 0.40                     14
    0.010 11     1             0.75000    0.00       0.00000 0.00   0.00
    1.200  5                   0.00000
          17
```

```
                    Subbasin 6
          _____

Percent Complete: [#########################] 100%



                    Subbasin 14
          _____

Percent Complete: [##########_____] 43%


WARNING : Autoirrigation has already been implemented in Global HRU 190   File: 000140009.mgt

Skipping and continuing with other HRUs...


Percent Complete: [#########################] 100%



                    Subbasin 15
          _____

Percent Complete: [#########################] 100%



                    Subbasin 22
          _____

Percent Complete: [###################_____] 79%
Warning: No crop is being planted in operations for global HRU 387
Percent Complete: [#########################] 100%



000060026.mgt
000140021.mgt
000140010.mgt
000140011.mgt
000140012.mgt
000150024.mgt
000150025.mgt
000220017.mgt
000220005.mgt
000220007.mgt



Finnished applying autoirrigation!
```