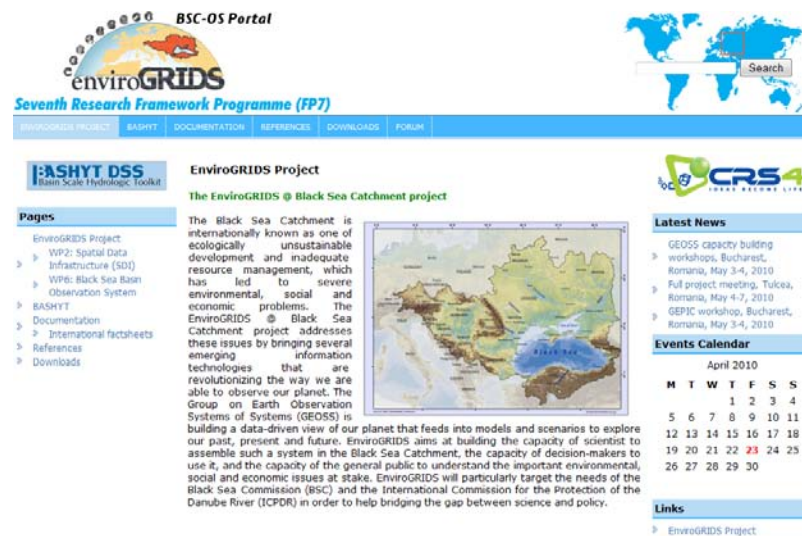


The MVC client server architecture of the BSC-OS portal to digest, manage, and query SWAT data collections

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BSC-OS Portal
enviroGRIDS
Seventh Research Framework Programme (FP7)

enviroGRIDS PROJECT | BASHYT | DOCUMENTATION | REFERENCES | DOWNLOADS | FORUM

ASHYT DSS
Rain-Scat Hydrologic ToolKit

EnviroGRIDS Project
The EnviroGRIDS @ Black Sea Catchment project

The Black Sea Catchment is internationally known as one of ecologically unsustainable development and inadequate resource management, which has led to severe environmental, social and economic problems. The EnviroGRIDS @ Black Sea Catchment project addresses these issues by bringing several emerging technologies that are revolutionizing the way we are able to observe our planet. The Group on Earth Observation Systems of Systems (GEOSS) is building a data-driven view of our planet that feeds into models and scenarios to explore our past, present and future. EnviroGRIDS aims at building the capacity of scientist to assemble such a system in the Black Sea Catchment, the capacity of decision-makers to use it, and the capacity of the general public to understand the important environmental, social and economic issues at stake. EnviroGRIDS will particularly target the needs of the Black Sea Commission (BSC) and the International Commission for the Protection of the Danube River (ICPDR) in order to help bridging the gap between science and policy.

Pages

- EnviroGRIDS Project
 - WPI: Spatial Data Infrastructure (SDI)
 - WPI: Black Sea Basin Observation System
 - BASHYT
 - Documentation
 - International factsheets
 - References
 - Downloads

Latest News

- GEOSS capacity building workshops, Bucharest, Romania, May 3-4, 2010
- Full project meeting, Tulcea, Romania, May 4-7, 2010
- GEPIC workshop, Bucharest, Romania, May 3-4, 2010

Events Calendar

April 2010

M	T	W	T	F	S	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

Links

- EnviroGRIDS Project



The context

Currently, the SWAT model is being run on the AVSWAT or ArcSWAT interfaces on desktop ESRI GIS environments (ArcVIEW and ArcGIS respectively.)

Such environments are convenient to set up the model and for its calibration, but are not optimized to share results between scientist, to expose them on the Internet and to make the SWAT become a operational tool for decision making.

AvSWAT and ArcSWAT show some instability due mainly to the ESRI GIS environment they run on.

The **AvSWAT** interface produces a file geo database dataset while the **ArcSWAT** interface produces a microsoft Access personal Geodatabase plus files. Both choices are not portable and in general cannot be easily extended.



Aim of the presentation

The use of **WEB based** innovative interactive **tools for data manipulation and report production** is expected to **increase data interpretation abilities** at present exploited **for the SWAT** model with Desktop technologies (basically founded on ESRI GIS).

In the presentation we show the use of **SPRITE**, client side, and **SWATSL**, server side, applications to digest SWAT Projects within the **BASHYT** portal.

BASHYT is a innovative web based information system optimised for the report production mechanism.



BASHYT:

is a **web based interface** to SWAT (input/output)

it works in tandem with ArcSWAT / AvSWAT.

relies on **web-GIS** and **RDBMS** technologies

produces reports in a easily fashion

can manage many watersheds/scenarios at once

expose on the web a templating environment to produce applications

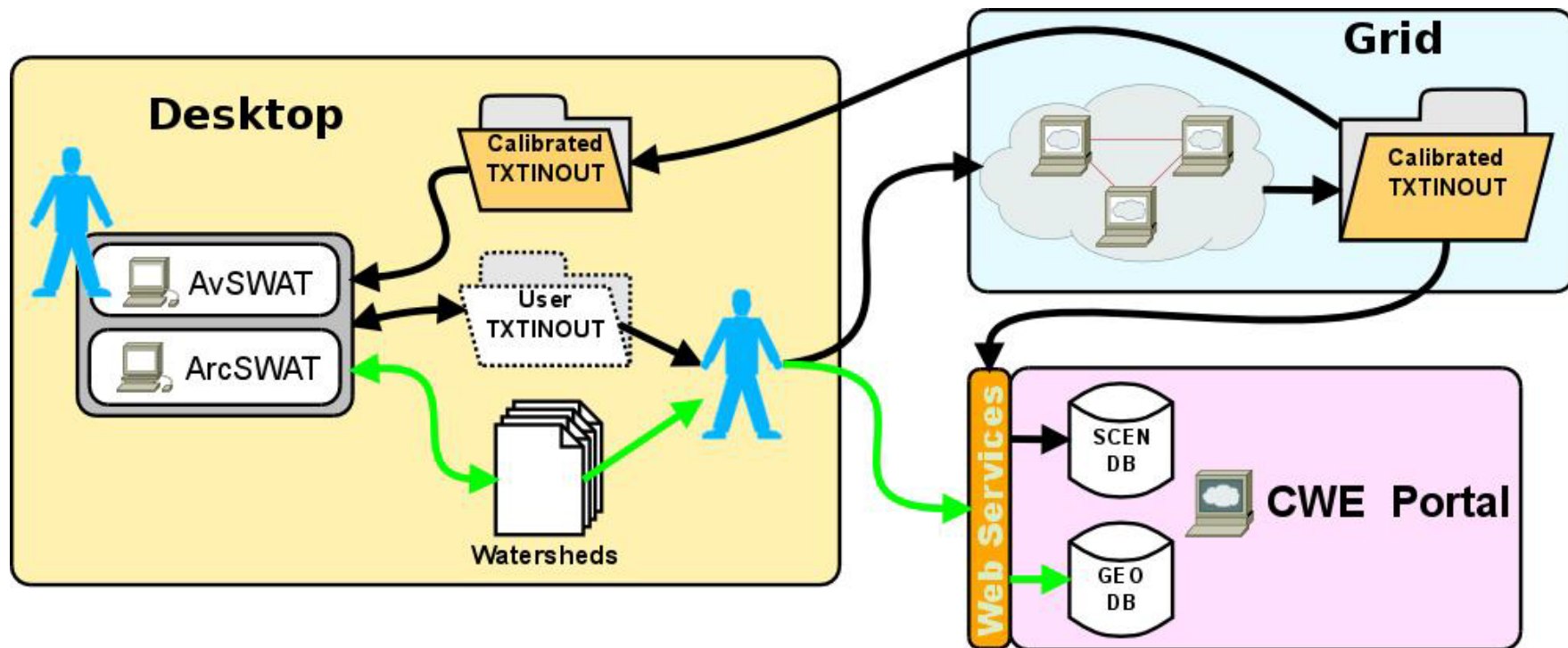
applications can be edited directly through the browser

its own authentication and authorization layer



SWAT Production Mechanism

We developed interoperability tools to load the desktop SWAT model projects (watersheds and simulations) to the CWE web environment

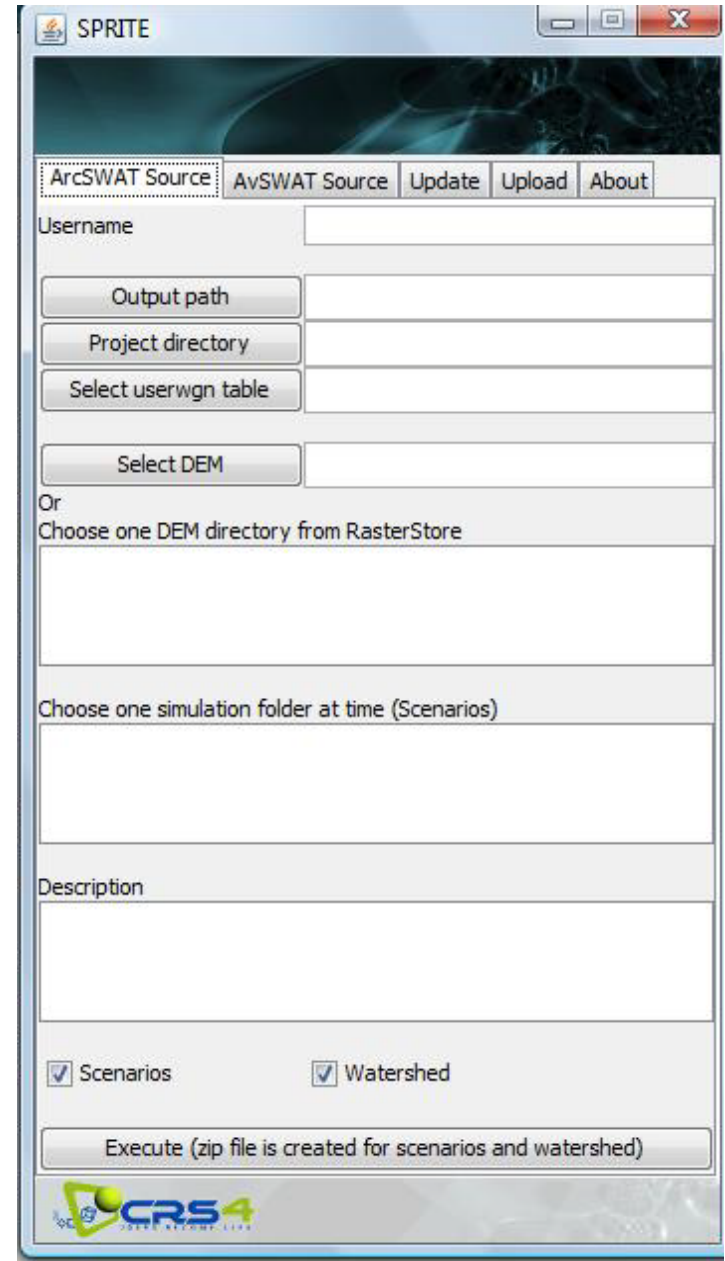


The SPRITE client application

Sprite is a stand alone Java program (ETL) that process AvSWAT/ArcSWAT projects to derive the necessary information to be uploaded to the BASHYT application to any server reachable on a LAN or on the Internet.

The main tasks performed by SPRITE are:

- Extract a minimum dataset
- Transform it (normalize its content)
- Populate a XML metadata file
- archive the data in 2 zip folders:
 - Watershed
 - Scenarios
- connect and upLoad the data to any BASHYT server



The SWATSL server side application

SWATSL is the server side application and work also as a standard ETL. It is programmed in C and its purpose is:

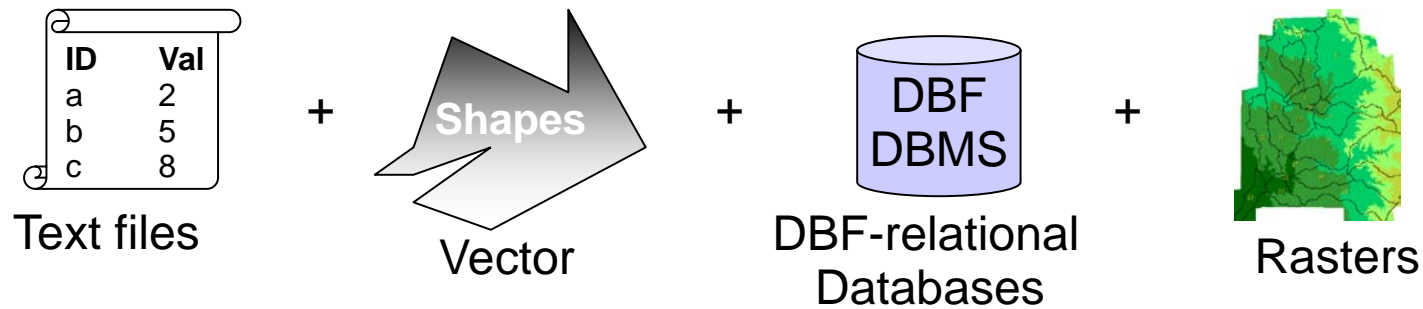
1. **Extract** the data,
2. **Transform** it to fit the operational needs
3. **Create an empty logical schema** of the geo-relational database (a spatialite db file). Such schema is fixed.
4. **Populate it**. SWATSL will import the data within the schema.

The transform stage applies a series of rules and functions to the extracted data from the source to derive the data for loading into the db file. Some data require very little or even no manipulation, other data require some change to fit the schema. SWATSL can be commanded from the application side, so each user of the portal with the privileges will be allowed to run it to import the uploaded projects within the system.

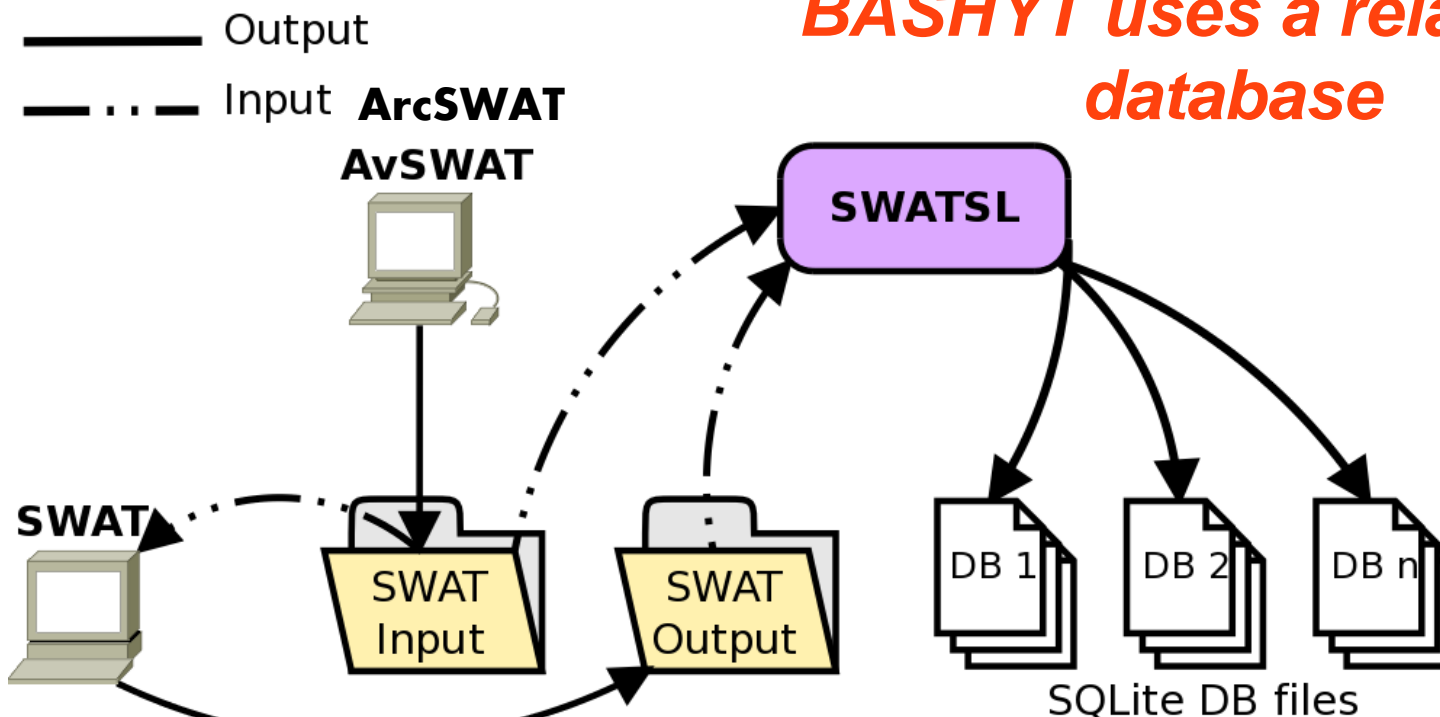


SWAT Data Preprocessing

The Av/ArcSWAT uses several different data formats



BASHYT uses a relational database



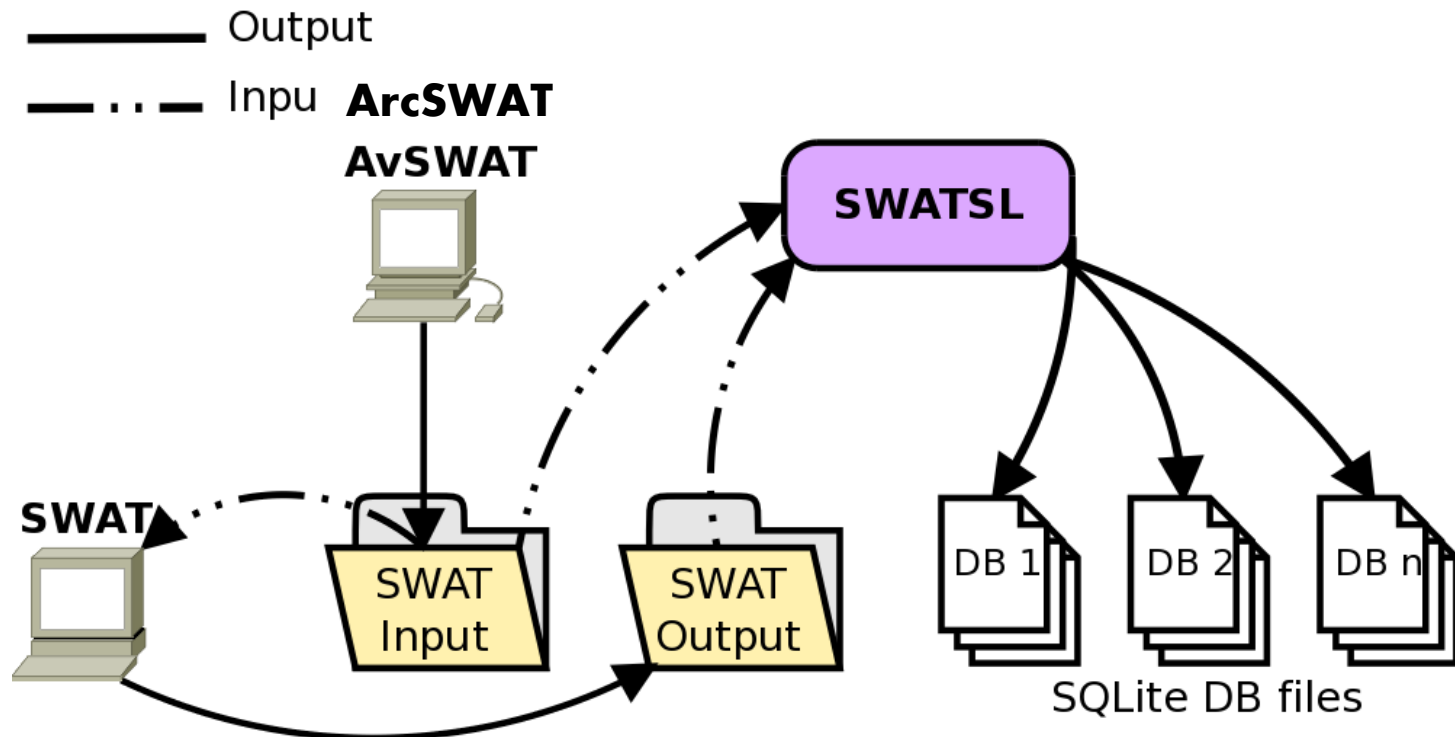
Preprocessing: A Data Driver Prototype

We are experimenting a new preprocessing approach

SWATSL is a C++ library that hide the complexity of the SWAT files architecture providing a uniform structured dataset for the user

SWATSL builds one or more SQLite database files and populate them with SWAT simulations (output/input)

After SWATSL has done its work, data can be accessed using common SQL queries



Conclusions and future work

SPRITE-SWATSL applications can enable Earth Science (ES) specialist, end users, etc. to deploy their significant simulations on the BASHYT interface in a easily way.

The SPRITE engine can be easily customized to adapt also to other SWAT interfaces (such as the MWSWAT) and it is a key added value to let the BASHYT interface be used by the SWAT community

We are currently developing new WEB interactive tools and applications. BASHYT and CWE environment are very promising technologies supporting the SWAT community.

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